Devoted to
TEXTILE
CHEMISTRY
BLEACHING
DYEING
PRINTING
FINISHING

MBER 4, 1946
ME 35, No. 22

AMERICAN DYESTUFF REPORTER

UNIVERSITY OF
NEBRASKA
AGRICULTURAL LIBRARY
NOV 20 1946

This new chrome color is especially recommended for use on worsted and woolen materials where good resistance to light, washing and dry cleaning is important . . . high-grade men's suitings, overcoatings, upholstery, etc. It is also an excellent color for dyeing tops and rawstock to be incorporated in blends.

"PONTACHROME" Grey GL is level dyeing, penetrates well, is readily soluble. Chromate method of application is preferred.

Our sales representative will be glad to give you additional information about this outstanding chrome color. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Division, Wilmington 98, Delaware.

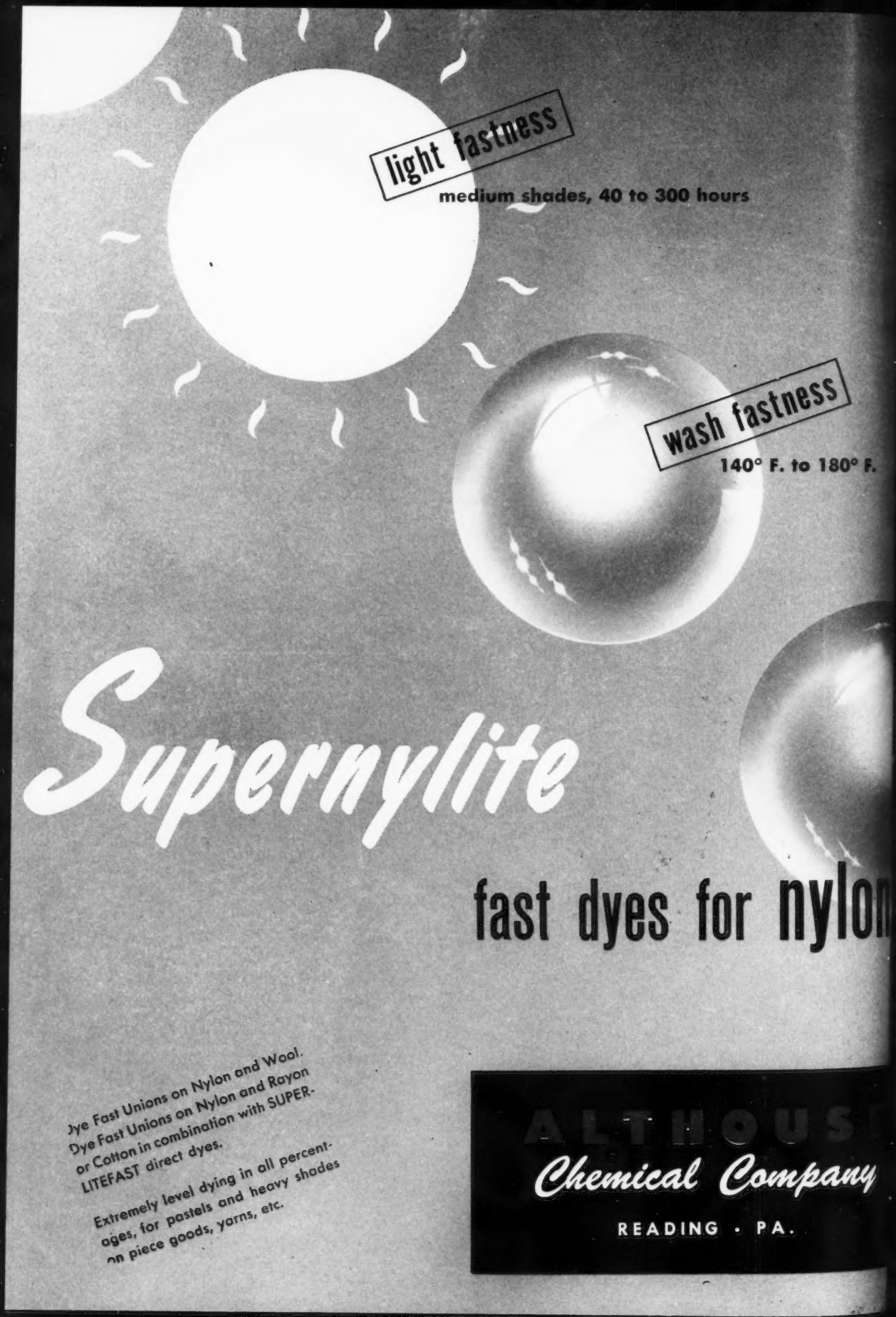
*REG. U. S. PAT. OFF.

Du Pont Dyestuffs

DUPONT

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

L PUBLICATION
of the
)CEEDINGS
N ASSOCIATION
TILE CHEMISTS
COLORISTS


light fastness
medium shades, 40 to 300 hours
wash fastness
140° F. to 180° F.
Supernylite
fast dyes for nylon
Dye Fast Unions on Nylon and Wool.
Dye Fast Unions on Nylon and Rayon
or Cotton in combination with SUPER-
LITEFAST direct dyes.
Extremely level dying in all percent-
ages, for pastels and heavy shades
on piece goods, yarns, etc.
ALTHOUSE
Chemical Company
READING · PA.

Now its the four-way dye-house assistant
NEW....IMPROVED
LEVELENE
A LEVELING AGENT
A PENETRANT
A RESIST-ING AGENT
VIVID COLORS
And now — A WETTING-OUT AGENT

NYANZA

ANILINE & ALIZARINE COLORS

•

TEXTILE CHEMICALS

•

FINISHING MATERIALS

FOR

WOOL — COTTON — RAYON — ACETATE

AND MIXED FIBERS

FACTORY AT ASHLAND, MASSACHUSETTS

NYANZA COLOR & CHEMICAL COMPANY, Inc.

215 WATER STREET NEW YORK CITY

FACTORIES:

CHEMICAL MANUFACTURING CO., ASHLAND, MASS. • NEW BRUNSWICK CHEMICAL CO., NEWARK, N. J.

BRANCHES:

Ashland, Massachusetts

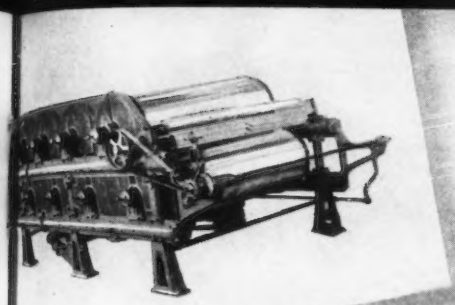
549 West Randolph St., Chicago, Ill. • 635 Drexel Bldg., Philadelphia, Pa. • 115 S.W. Fourth Ave., Portland, Ore.

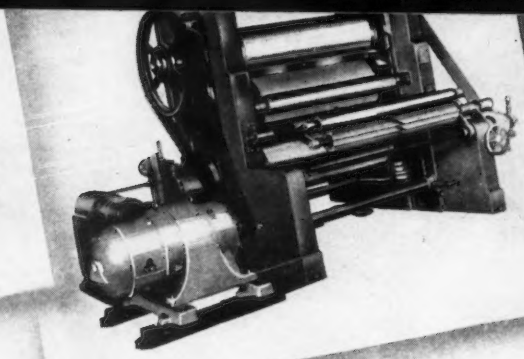
2657 Magnolia Ave., Knoxville, Tenn. • 304 E. Moorehead St., Charlotte, N. C.

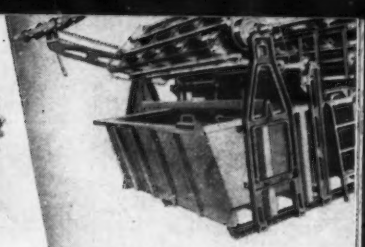
CANADIAN AGENTS:

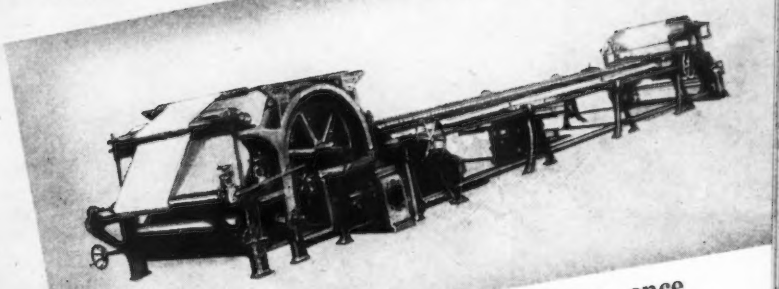
Charles Albert Smith Limited, 123 Liberty St., Toronto, Canada

American Dyestuff Reporter, Vol. 35, No. 22, November 4, 1946. Published every other Monday. Copyright 1946, by Howes Publishing Co., 0 Madison Ave., New York 10, N. Y. Domestic subscription, $5.00; Canadian, $6.00; Foreign, $6.00. Entered as second-class matter, Nov. 6, 1919, at the New York, N. Y., Post Office, under the act of March 3, 1879.









BACK ON THE JOB!

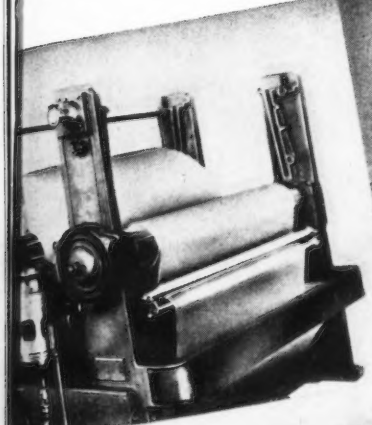
It's satisfying to be manufacturing once again for our regular trade in the textile field. We've new ideas about machine design—many already are incorporated in our full line of equipment. For instance: the tensionless jig, the tuber and others now in production. And we've an entirely new heavy-duty tenter for those who want the last word in capacity and modern construction.

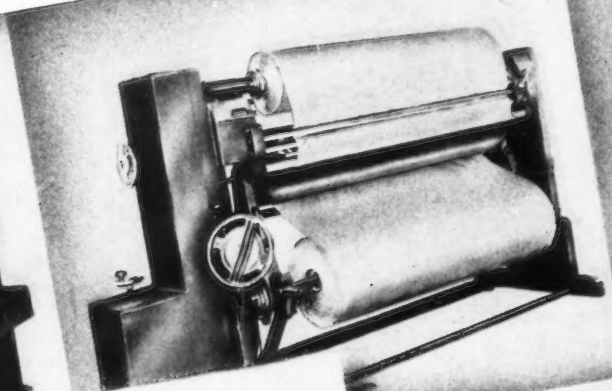
Whether your needs are for one machine or a complete plant installation, we will be happy to discuss them with you.

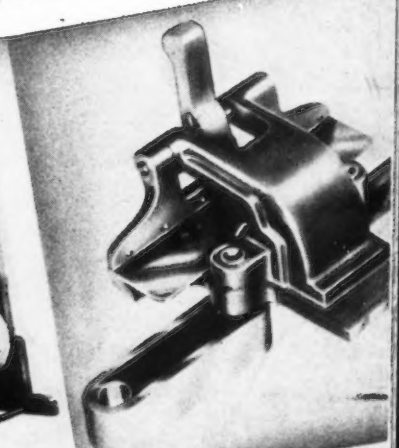
VAN VLAANDEREN MACHINE COMPANY

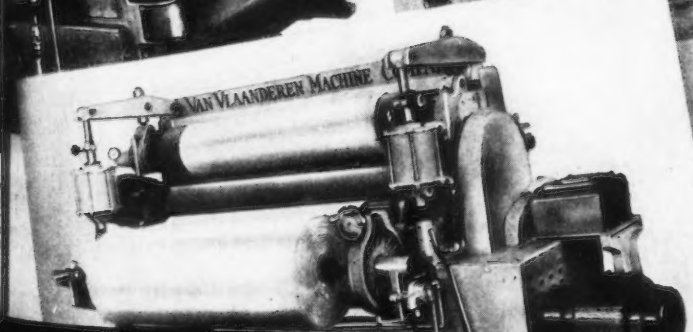
370 Straight Street, Paterson 3, New Jersey • Cable Address: VLAANDEREN, PATERSONNJ, U. S. A.

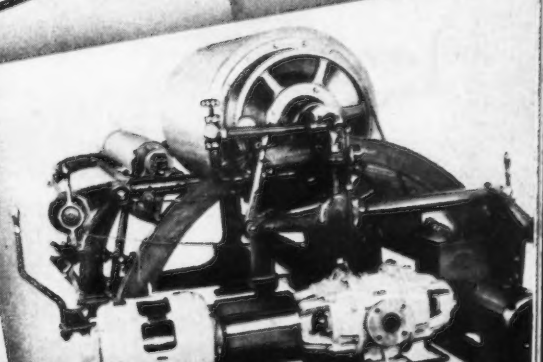
World's largest manufacturer of machinery for processing modern fabrics











MILL MEN have found out about PARAMINE. . . . They know that to specify PARAMINE is to assure a highly desirable, wool-like texture for spun rayons, and an extra-mellow softness for all rayons, synthetics and cottons . . . and mill executives are pleased to find that PARAMINE gives this added sales value without increasing and often lowering finishing costs!.

Demonstration or further information furnished at your request. . . .

ARKANSAS CO., INC.

Manufacturers of Industrial Chemicals for over 40 Years

Newark, New Jersey

Protect acetate colors from Gas and Fume Fading

VELVAMINE GF

Produces a soft mellow finish!

Velvamine GF is a blend of amines and softeners designed to protect acetate colors from gas or fume fading. It resists removal by drycleaning and, when used on mixed fabrics, has a minimum effect on the shade and light fastness of the direct colors

Velvamine GF produces a soft, full hand and does not affect the appearance of the treated fabrics.

Velvamine GF is compatible with resins, gelatine, glue, starches, dullers and similar finishing compounds.

REFINED PRODUCTS COMPANY
Lyndhurst • New Jersey

*** Manufacturers of PERMA-CIDE, the approved, outstanding, mildew-proofing agent**

Southern Representative: DYER S. MOSS, 1301 Liberty Life Bldg., Charlotte, North Carolina

New England Representatives: E. L. LEGG, P. O. Box 597, Providence, R. I.
CLARENCE E. MOSS, 19 Wilson Ave., Rumford (16) R. I.

Canadian Selling Agents: Berkeley Products Canada, Ltd., 41 Hillcrest Avenue, St. Catharines, Ontario, Canada
Exporting Agent: Chem-Col Company, 82 Wall St., New York City

THIS TEAM PULLS *Smoothly* IN HOSIERY SCOURING

Whether your choice falls on soap or synthetic detergents for scouring and dyeing rayon or nylon hosiery, you can count on topnotch results with either Olate or Orvus. A glance at some of the characteristics of these two time-tested cleansing agents will guide you in your choice.

Olate

A pure, neutral soap of exceptionally low titer.

Fast dissolving—free rinsing.

Fluid solutions wet out fibers quickly, evenly, thoroughly—guard against uneven dyeing.

Excellent emulsifying properties. Holds spinning and coning oils firmly in suspension until they are flushed.

Resists oxidation, rancidity and odor development.

ORVUS*

Provides thorough, uniform penetration of dyestuffs.

Thoroughly emulsifies and removes coning and knitting oils.

Prevents lime soap specks and oil spots.

Minimizes danger of non-uniform dyeing on cotton tops and feet.

Eliminates streakiness and blotches.

Procter & Gamble

*TALK OVER YOUR ORVUS NEEDS WITH YOUR PROCTER & GAMBLE SALESMAN.

COPRANTINES
For dyeing acetate and rayon blends that meet modern fastness requirements (particularly in dark shades), use COPRANTINES on the rayon, the new dyestuff range that combines both wash and light fastness.
DYESTUFFS • CHEMICALS • INTERMEDIATES
CIBA
COMPANY INC.
Greenwich & Morton Sts.
NEW YORK
BOSTON · CHICAGO · MONTREAL · CHARLOTTE
PROVIDENCE · SAN FRANCISCO · PHILADELPHIA
VAT DYES OF THE DOW CHEMICAL COMPANY

Low Cost Lasting Water Repellency

Durable water repellency at no greater cost than that of ordinary fugitive repellent finishes . . . that's what you get with

REPEL-O-TEX

COTTON, viscose, acetate, rayon and any other properly prepared fabrics are treated in the normal manner with no extra handling in the mill – no curing, no washing and no after treatment. Treated goods are also stain and perspiration resistant.

A spray rating of 100 is obtained on any suitably prepared fabrics when treated with the recommended formula of Repel-O-Tex D3 and D4. After three dry cleanings (U. S. Army specifications) or three washings (at 100°F. with 0.1% soap and 0.05% soda ash) the rating will be 70 or better.

Any desired hand or finish can also be obtained by suitable variations in the proportions of Repel-O-Tex D3 and D4 used.

Ask for a plant-scale demonstration of durable water repellency with Repel-O-Tex D3 and D4.

ONYX OIL & CHEMICAL COMPANY
JERSEY CITY 2, N. J.
CHICAGO • PROVIDENCE • CHARLOTTE • ATLANTA • LOS ANGELES
In Canada: ONYX OIL & CHEMICAL CO., LTD. — MONTREAL, TORONTO, ST. JOHNS, QUE.
For Export: ONYX INTERNATIONAL, JERSEY CITY 2, N. J.

onyx CHEMICALS FOR DYEING AND FINISHING

DYEING CLOTH BY CRUDE HAND METHOD. From early print* believed to be of the Fifteenth century. It was during this century that the first color regulations were issued by the City of Venice, and the Dyers Company was incorporated in London . . . *Reproduced by courtesy of New York Metropolitan Museum of Art.

Five Centuries of Progress...

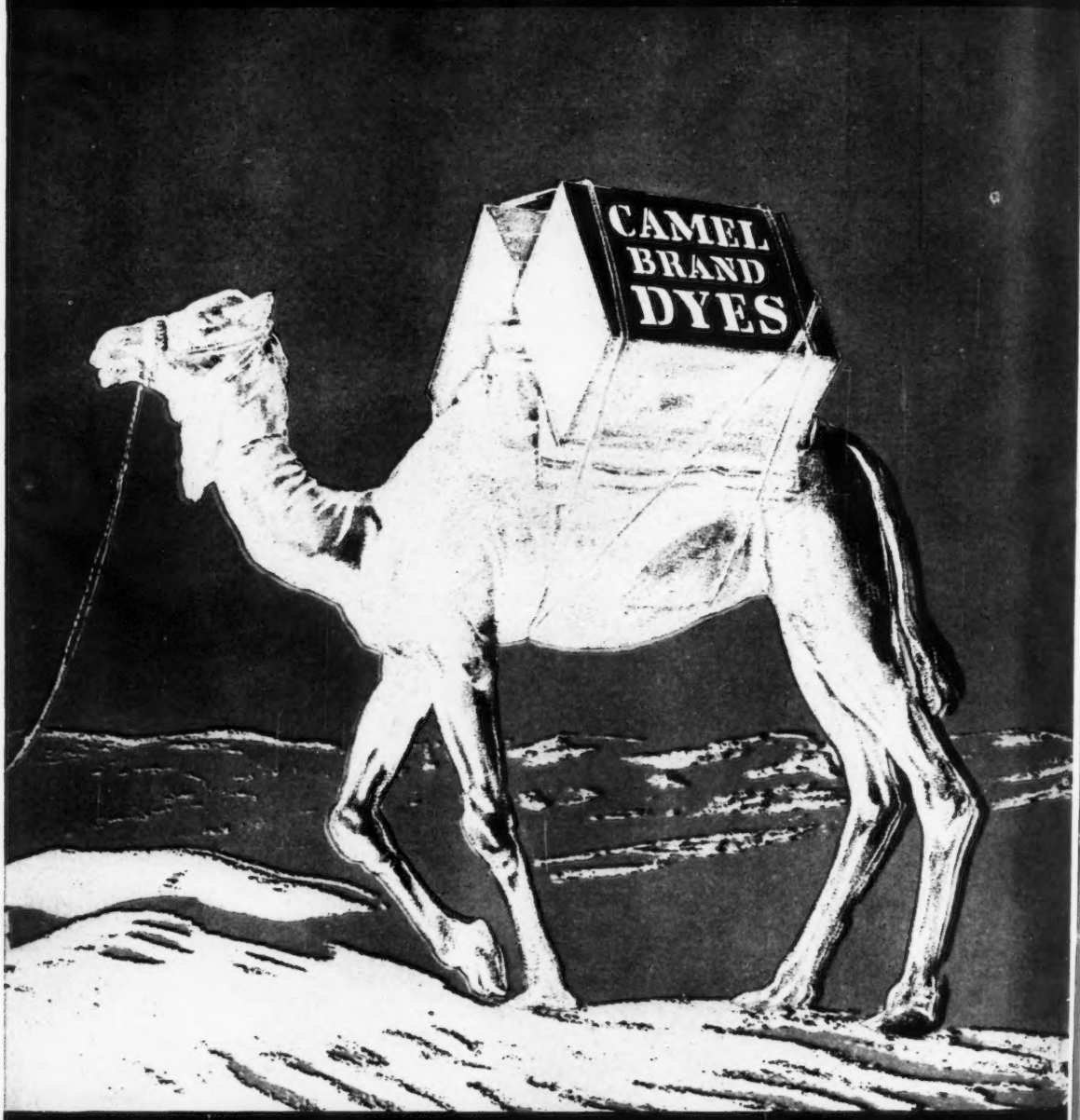
THE continuous dyeing ranges of today stand in sharp contrast to the crude kettles of the 15th Century. Progress by the Dyeing Industry has been amazing both with respect to volume of production and quality of work. Preparatory processes, too, have been improved and have contributed generously to the success of the industry . . . . . The makers of RAPIDASE, for rapid dependable desizing, are proud to serve this industry and the men who continue the tradition of progress.

RAPIDASE

WALLERSTEIN COMPANY, INC. 180 Madison Ave., New York 16, N. Y.

QUALITY DYESTUFFS

SINCE 1878



JOHN CAMPBELL & COMPANY, INC.

75 HUDSON STREET • NEW YORK CITY

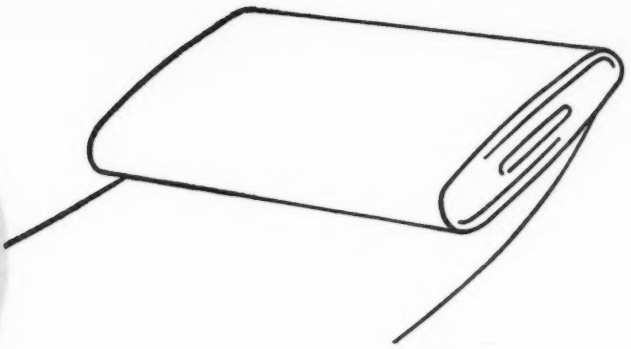
TELEPHONE: BArclay 7-6228-6229

PHILADELPHIA: BROAD AND SPRING GARDEN STS.

BRANCH OFFICES AND WAREHOUSES:

BOSTON EAST CLEVELAND, OHIO ATLANTA, GA.

Regardless of the Fibre you Handle



...Bleach it with BECCO Hydrogen Peroxide!

Whether you bleach your goods in kiers, in package or other machines, by the cold bleach or by continuous steam bleaching methods, Becco Hydrogen Peroxide is the ideal bleaching agent. This is true whether you handle cotton, wool, knit goods, rayon or other natural and synthetic fibres.

And remember that Becco Hydrogen Peroxide is very easy to handle. It is shipped in drums or tank cars. It can be pumped or automatically fed to the point of use. This is especially important for efficient continuous bleaching operation.

Why not take advantage of Becco's many years of specialized bleaching experience? Ask our engineers and chemists to advise you what system is most suitable for processing your goods, regardless of the type of fibre used. This bleaching "know-how" can now be yours, free. Write to

BECCO SALES CORPORATION

AGENTS FOR BUFFALO ELECTRO-CHEMICAL CO., INC.

2 Sawyer Avenue, Buffalo 7, N. Y.

New York Boston Philadelphia Chicago Charlotte

Hooker Chemicals for Textiles

If you are interested in bleaching, dyeing and finishing textiles, Hooker can supply many of the chemicals you need. Your work will be made easier, your operations will run smoothly and your product will be of uniform high quality when you use Hooker Chemicals.

Careful control combined with specially developed manufacturing techniques of Hooker Chemicals assures you of uniformly high quality in every shipment to your plant.

Listed below are some of the Hooker Chemicals that are serving the dye and textile industries. These and many others are listed in the Hooker General Products List, Bulletin 100. Technical data sheets are also available describing each product more completely. Just write "Bulletin 100" and the names of any products on which you would like more information on your letterhead and sign your name. The literature you want will be on its way by return mail.

PRODUCT *Chemical Formula; Molecular Weight*	HOOKER SPECIFICATIONS	SUGGESTED USES
Aluminum Chloride Anhydrous $AlCl_3$; 133.3	Aluminum Chloride ..... 98.5% Min. Iron ..... 0.05% Max. Non-sublimables in air at 950°C. 1.5% Max.	Catalyst in synthesis of dyestuffs and intermediates.
Benzoic Acid-USP and Tech. C_6H_5COOH; 122.1	Benzoic Acid ..... 99.3% Min. Water ..... 0.2% Max.	Manufacture of dyes. Mordant.
CP—70 $C_{21}H_{29}Cl_{21}$; 1063	Chlorine ..... 71 ± 2% Iron ..... 0.01% Max. Softening range ..... 90° to 100°C A chlorinated paraffin resin in powder form. Soluble in aromatic solvents, difficultly soluble in mineral spirits.	Treating textiles to make water, fire and mildew-proof.
Ferric Chloride Solution $FeCl_3$; 162.2	$FeCl_3$ ..... 40 to 42% $FeCl_2$ ..... 0.20% Max. Sp. Gr. ..... 1.44 ± .01	Mordant in dyeing and printing textiles; as oxidizing agent in making dyes.
Lauryl Pyridinium Chloride $C_5H_5N(C_{12.6}H_{26.2})Cl$; 292.0	Mottled tan, semi-solid. Solubility in water is 60 gms. per 100 gms. of water. Alkyl Pyridinium Chloride (Calc. as C_{12})...85.0% Min.	Cationic detergent. Wetting and cleaning agent for textile fibers. As a leveling agent and color modifier in dyeing.
Orthodichlorbenzene $C_6H_4Cl_2$; 147	Clear, colorless liquid. Freezing Point ..... −10° to −22°C Boiling Range ..... 6° including 179°C	Manufacture of pyrocatechin, dye intermediates, other synthetic organic chemicals. Degreasing wool.
Sodium Sulfhydrate NaSH; 56.1	NaSH ..... 70 to 72% Fe ..... 5 ppm Max. Na_2S ..... 1 to 2 % NaCl ..... 1% Max. Na_2SO_3, $NaHCO_3$ ..... 1% Max. Cu, Ni, Cr, Mn, Pb ..... 1 ppm Max. Water of crystallization ..... 28 to 26%	Desulfurizing rayon; calico printing; in sulfur dye baths.
Sodium Sulfide Na_2S; 78.1	Na_2S ..... 60 to 62% Fe ..... 8 ppm Max. NaCl ..... 1.5% Max. Other Na Salts ..... 2.0% Max. Cu, Ni, Cr, Mn, Pb ..... 1 ppm Max. Water of crystallization ..... 36.5 to 34.5%	Desulfurizing rayon; calico printing; in sulfur dye baths.

HOOKER ELECTROCHEMICAL COMPANY

HOOKER CHEMICALS

2 FORTY-SEVENTH ST., NIAGARA FALLS, N. Y.
New York, N. Y. Wilmington, Calif. Tacoma, Wash.

Caustic Soda **Chlorine** **Muriatic Acid** **Paradichlorbenzene** 2140

Around the calendar and around the clock wherever accuracy and uniformity of shade are imperative, National Dyes are preferred . . . for textiles of every type; for hosiery, handbags, shoes and hats; for cosmetics and pharmaceuticals; for paper, leather, plastics and every other coloring need.
From basic raw materials, National Aniline alone makes every class of aniline dye and color . . . offers America's oldest and broadest color application experience.
WHEREVER COLOR IS USED
National Aniline
DIVISION OF
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET NEW YORK 6, N. Y.
BOSTON · PROVIDENCE · PHILADELPHIA · CHICAGO · SAN FRANCISCO · CHARLOTTE
GREENSBORO · ATLANTA · NEW ORLEANS · CHATTANOOGA · PORTLAND, ORE. · TORONTO
NATIONAL DYES

Hundr
for ho
dustria
phatic
are ass
mainta
One of
Solvent

Great name in the Petroleum Industry...

Ideal Industrial Solvents for You!

Hundreds of industries look to Esso Representatives for honest, friendly advice in the application of industrial solvents. Esso sells both aromatic and aliphatic solvents. Constant uniformity and suitability are assured by the close, continuing product control maintained at our large refineries and laboratories. One of the many different grades of Esso Petroleum Solvents will serve you, whatever your requirements.

STANDARD OIL COMPANY OF NEW JERSEY

Elizabeth, N. J. — Charlotte, N. C.
Baltimore, Md. — Columbia, S. C.
Richmond, Va. — New Orleans, La.
Charleston, W. Va. — Little Rock, Ark.
Memphis, Tenn.

STANDARD OIL COMPANY OF PENNSYLVANIA

Philadelphia, Pa.

COLONIAL BEACON OIL COMPANY

Boston, Mass. — New York, N. Y.

AGAIN AVAILABLE—NOPCO* DIRECT NO. 1 (1854-X)

THE LEADING PRE-WAR SILK SOAKING OIL FOR HOSIERY TRAM

MAXIMUM LUBRICATION is again assured for tram—and a CLEAR REGULAR STITCH for hosiery

Before the war, Nopco Direct No. 1 (1854-X) was the largest selling silk soaking oil for hosiery tram—impressive proof of quality far above average. Nopco Direct No. 1 today offers the identical yarn—improving advantages which made it the favorite soaking oil of leading Throwsters and Knitters.

How Nopco Direct No. 1 (1854-X) Helps Improve Hosiery Tram

MAXIMUM LUBRICATION. Nopco Direct No. 1 contains an exclusive additive, which insures complete lubricity for every filament.

CONTROLLED SOLUBILITY. Nopco Direct No. 1 permeates the sericin or gum *thoroughly* and softens it *uniformly*. Result—yarn exceptionally well conditioned for more effective throwing, coning and knitting.

GREATER YARN PLIANCY. The thorough external and internal gum-softening action of Nopco Direct No. 1 leads to the following product benefits . . . better loop formation in knitting, insuring a clear, even stitch. Yarn of this type produces a stocking with less roll on the machine—and in the final phase, easier looping and seaming.

GREATER ECONOMY. Nopco Direct No. 1 —combined with recommended alkalies— is almost 100% exhausted from the soaking bath and into the soaked yarn.

To get a more complete picture of how Nopco Direct No. 1 (1854-X) can help bring peak quality to your silk yarn, write for interesting, informative booklet.

NATIONAL OIL PRODUCTS COMPANY, Harrison, N. J.

Branches: Boston • Chicago • Cedartown, Ga. • Richmond, Calif.

NOPCO EVOLVED THROUGH RESEARCH

REG. U.S. PAT. OFF.

NOPCO DIRECT NO. 1

SILK SOAKING OIL

PERKINS HOLYOKE

TRADE MARK REG.

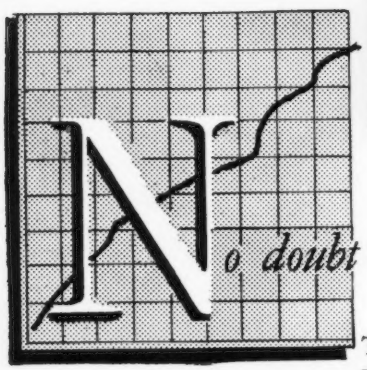
For the Textile Industry

Cotton Rolls
Cotton and Wool Rolls
Combination Rolls
Husk Rolls
Paper Rolls
Embossing Rolls
Friction Calenders
Schreiner Calenders
Chasing Calenders
Rolling Calenders

Silk Calenders
Embossing Calenders
Cloth Pilers
Drying Machines
Dye Jigs
Mangles
Padders
Squeezers
Washers
Winders

Mullen Testers

FOR FATTY ACIDS AND THEIR DERIVATIVES THE TREND IS TO HARDESTY



o doubt about it!

The trend is to HARDESTY for fatty acids and their derivatives, started when our first shipment was made. It was accentuated during the wa r when HARDESTY provided many answers to problems created by shortages of imported raw materials. And even now, many manufacturers who followed the trend to HARDESTY simply as a war time expedient have decided—on the basis of superior performance for less cost—*never* to go back to high priced imports.

There's a reason behind this trend to HARDESTY—above and beyond HARDESTY'S dependable quality fatty acids . . . HARDESTY'S research laboratory and technical service department are constantly demonstrating to manufacturers how they can save money by first consulting HARDESTY on a new problem.

HARDESTY products are made in various grades to meet the requirements of the chemical, cosmetic, soap, rubber and other industries. At present it is impossible to render the traditional Hardesty Prompt Service, but if you have a problem, our knowledge and experience in fatty acids and their derivatives are ready to go to work for you. We can show you with information and samples why it pays TO KEEP IN TOUCH WITH HARDESTY.

W. C. HARDESTY COMPANY, 41 East 42nd St., New York 17, N. Y
Factories: Dover, Ohio; Los Angeles, Calif.; Toronto, Canada

HARDESTY PRODUCTS: STEARIC ACID • RED OIL • GLYCERINE • STEARINE PITCH • WHITE OLEINE • HYDROGENATED FATTY ACIDS • ANIMAL AND VEGETABLE DISTILLED FATTY ACIDS

W·C· HARDESTY COMPANY

New AHCOFLEX *Softeners*

for 2 in 1 Performance

When you want an inexpensive penetrating softener for heavier, coarser cottons such as denims, ducks and coverts, specify Ahcoflex.

Ahcoflex gives 2-in-1 performance in thorough softening action, and re-wetting of fabrics which are to be Sanforized. Ahcoflex has been tested and proved in carefully selected full scale finishing processes. Now, Ahcoflex is available in quantity.

This new softener is easy to use, generally compatible with all ordinary finishing agents, and it will neither discolor fabrics nor cause them to become rancid during storage. Eliminate entirely the nuisance of two products and two operations on fabrics to be Sanforized. Use Ahcoflex for 2-in-1 economy and efficiency.

Write for test sample and further information, or send us a swatch of your coarse cottons for Ahcoflexing here.

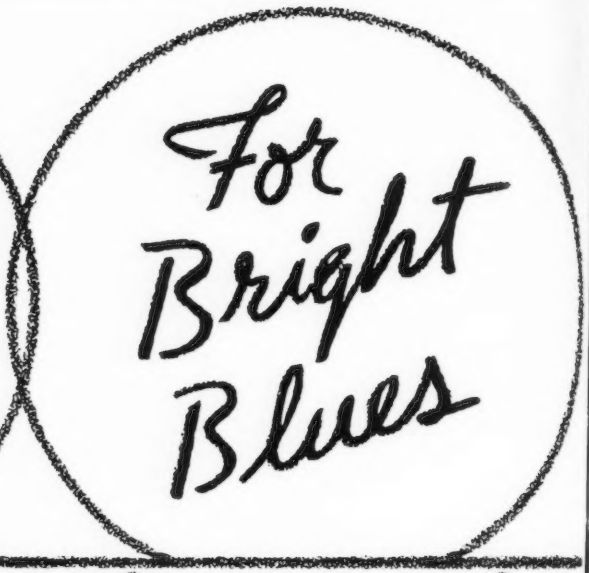
ARNOLD, HOFFMAN & CO., INC.

MANUFACTURING CHEMISTS

ESTABLISHED 1815 • PLANTS AT DIGHTON, MASS. AND CHARLOTTE, N. C.

PROVIDENCE, RHODE ISLAND

NEW YORK BOSTON PHILADELPHIA CHARLOTTE



Pharmasols

Blue GNXX
Blue GDNN

THESE azoic colors, for printing cotton, linen or rayon, produce Navy Blue of good fastness at a low cost. In combination with the Pharmasol Yellows they produce deep Browns.

PHARMASOLS are stabilized solutions, adjusted to the most practical concentration, which can be easily applied with a maximum of efficiency.

PHARMASOLS do not decompose and thereby they overcome the otherwise problems of troublesome dissolving.

Indigosol

BLUE IBC

THE outstanding soluble vat color for producing bright Blues in any depth, of excellent fastness, is Indigosol Blue IBC. It is suitable for dyeing, padding and printing on cotton, linen or rayon (excepting acetate fibers) where maximum fastness is required.

Indigosol Blue IBC is an important member of the group of very fast Indigosols, all of which are readily soluble and easily developed.

CARBIC COLOR AND CHEMICAL CO., INC.

451-453 Washington Street, New York City

BRANCHES:
PHILADELPHIA
PROVIDENCE HAMILTON, ONT.
CHARLOTTE, N. C.

IMPORTERS OF THE MANUFACTURES OF
DURAND & HUGUENIN S. A.
BASLE, SWITZERLAND

EXCLUSIVE DISTRIBUTORS OF
PHARMASOLS
PHARMOLS
PHARMACINES

Representatives: Los Angeles (Hathaway Allied Products)

AMERICAN DYESTUFF REPORTER

LOUIS A. OLNEY, D.Sc
Directing Editor

NORMAN A. JOHNSON, B.T.C
Managing Editor

MYRON D. REESER
Advertising Manager

GRACE B. BURTON
Production Manager

M. H. MORGAN
Circulation Manager

Official Publication of the Proceedings of the American Association of Textile Chemists and Colorists

Published every other Monday by HOWES PUBLISHING COMPANY, INC. One Madison Avenue, New York 10, N. Y.

A. P. HOWES
President

C. R. HOWES
Vice President

H. F. CRAWFORD
Treasurer

M. D. REESER
Secretary

C. ESSENBREIS
Asst. Secretary

Also Publishers of KNIT GOODS WEEKLY TEXTILE COLORIST AND CONVERTER

NOVEMBER 4, 1946

VOLUME 35 NUMBER 22

Contents

Contents of previous issues can be found by consulting the Industrial Arts Index at your library

• Special Articles

The Sodium Hydroxide Method for the Determination of Vegetable Matter in Wool..... 509
George C. LeCompte and Mayne R. Coe, Jr.

The Dyeing of Hosiery in Germany..... 511
Thomas R. Smith

Hot Water Heating of Dye Liquor..... 512
Thomas R. Smith

Toxicity of Germicides..... 521
Louis C. Barail

• Departments

Trade Notes—New Products..... 524

• Proceedings of the American Association of Textile Chemists and Colorists

Control of Shrinkage and Crease Resistance of Viscose Rayon Fabrics.....P514
H. F. Creegan

Speakers, Committees, Papers and Judges Announced for the Intersectional Contest.....P519

Registration for Silver Jubilee Convention.....P520

Meeting, Northern New England Section.....P520

Calendar of Coming Events.....P518

Copyright, 1946, Howes Publishing Co., Inc.

for that FINISHING Touch

CORASIL RT!

Looking for that "Finishing Touch" on your Rayons, Acetates, and other Synthetics and Mixtures?

Where extreme softness, elegant draping qualities and exquisite hand are desired, turn to Corasil RT. For this highly concentrated synthetic ester is the ideal plasticizer and softener for rayon crepe soaking, rayon warp sizing, fabric finishing and back-filling cottons.

Make a mental note now to give Corasil RT a real trial in your softening and plasticizing operations. Write today for detailed information and experimental samples of Corasil RT.

E. F. DREW & CO., INC.

Main Office: 15 East 26th Street, New York 10, N. Y.

80 Federal Street, Boston 10, Mass. — Factory & Laboratories, Boonton, N. J. — 919 N. Michigan Ave., Chicago 11, Illinois

I am interested in Corasil RT

- ☐ Send complete information
- ☐ Send sample for mill trial
- ☐ Have technical representative call

Name .....

Company .....

Street .....

City ..... State .....

Drew TESTED

AMERICAN
DYESTUFF REPORTER

VOLUME 35 NOVEMBER 4, 1946 NUMBER 22

The Sodium Hydroxide Method for the Determination of Vegetable Matter in Wool

GEORGE C. LeCOMPTE and MAYNE R. COE, JR.

U. S. Department of Agriculture

SEVERAL methods for the determination of vegetable matter in wool have been described in earlier issues of this publication and elsewhere.[1] The transparizing procedure of Tanner and Wollner[2] is fairly rapid and accurate, but has the disadvantage of psychological uncertainty in visual matching and of necessitating previous preparation of a very large number of photographic plates. The hydrogen peroxide, sodium carbonate method of Lipson[3] appears to be fairly accurate, but possesses the disadvantage of a rather cumbersome manipulative procedure. The sodium hydroxide, hypochlorite method reported upon in (1) is rapid and fairly accurate. Further work by the Department of Agriculture has shown that the sodium hydroxide, hypochlorite method could be improved upon and simplified by the use of sodium hydroxide alone. The new method, which is quicker and cheaper, is described in this paper.

The ordinary 5 per cent NaOH boil method acts by dissolving the wool so that the isolated vegetable matter can be filtered off, dried, and weighed. In the technique as ordinarily followed, a 5-gram sample of wool is immersed in 500 mls. of NaOH solution and the mixture is brought to a boil. Bringing the mixture to a boil requires about 10 minutes, after which it is necessary to continue the heating for a rather lengthy period in order to dissolve the wool properly. During this prolonged heating and boiling, the v.m. is rather severely damaged. Different types lose weight to varying extents, and some types suffer very serious losses. Experiments with the 40 per cent NaOH solution used in the NaOH, NaOCl method, indicated that the wool would dissolve slowly in warm 40 per cent NaOH. Investigating this further, it was found that boiling 40 per cent NaOH had a remarkable capacity to dissolve wool, a sizable sample being dissolved in as short a time as 30 seconds. The method appeared so promising that experiments were set up with known amounts of different types of v.m. mixed in with samples of v.m.-free top. The v.m. was isolated from the wool by dissolving the wool with boiling 40 per cent NaOH. The isolated v.m. was then washed, dried, and weighed. The results were rather poor, because with cocklebur the recoveries, after the isolation procedure, were as high as 140 per cent, while with alfalfa the recoveries were as low as 35 per cent. Apparently the alfalfa was being extensively dissolved, while the NaOH was absorbed by the cocklebur in such a manner that it could not be washed away.

A series of experiments was undertaken to set up conditions so that any type of v.m. likely to be found would be isolated and recoveries would be accurate, while at the same time the dissolving and isolating procedure would be easy, quick, and inexpensive. The final isolation procedure decided upon represented a compromise between the demands of rapidity and the ease of dissolving and the accuracy of results. After the method had finally been decided upon, experiments were made in which known amounts of v.m. were mixed with v.m.-free top, and the v.m. was isolated by the NaOH procedure, and washed, dried, and weighed. The experimental details follow.

Experimental Details

The v.m. samples were obtained directly from the plants in order to avoid the possibility of contamination with wool. Experiments were run with the following types of v.m.: (1) cocklebur, (2) spiral burs, (3) straw, (4) sandburs, (5) alfalfa. In all cases the v.m. was given a preliminary 3-minute soak in 0.075 per cent detergent and 0.75 per cent sodium carbonate at 135° F., after which it was rinsed and dried. This treatment was the same as that the v.m. would have received during the ordinary wool scouring operation. Portions of the above types of v.m. were placed in weighing bottles, bone dried, and weighed. Some of these portions of each type of v.m. were used in determining the amount of ash and of extractives originally present. With these results, the weights of bone-dry, ash-free, and extractives-free v.m. in each sample could be calculated. Such weights were used as the bases for calculating the percentage recovery of v.m. It is necessary to use such weights since the moisture, ash, and extractives contents of the v.m. in the wool sample are included when the moisture, ash, and extractives contents of the sample itself are determined. Wool top was rendered free of v.m. by examining it against a strong light and picking out all fragments of v.m. The bone dried samples of v.m. were mixed with 20-gram portions of this v.m.-free top.

In the isolation procedure, the 20-gram sample of top with the added v.m. was placed in a 1-liter beaker. Into this mixture there was run 400 mls. of boiling 10 per cent NaOH. The 10 per cent NaOH was kept heated in a sizable container with a dispensing spout at the bottom. In about 2 minutes the samples were thoroughly dissolved, at which time there was added approximately 500 mls. of cold water in order to moderate the action of

the NaOH upon the v.m. The brown-colored liquid was then filtered through a single layer of fine cheesecloth or wide gauze bandage, 40 meshes to the inch. The filter cloth itself was most conveniently held by suspending it over a 6-inch glass funnel and holding the upper edges with photographic or paper clips. (The filtering cloth should be allowed to sag slightly so that the isolated v.m. may be easily washed to the center of the filtering cloth. However, if allowed to sag too much, the area available for filtration is restricted and the filtration will be slow.) After the v.m. was filtered off, it was washed towards the center by a stream of cold water from a wash bottle. It was next rapidly washed with a small amount of 5 per cent NaOCl, in order to insure the complete solution of all wool. It was then given a final rapid washing with cold water. The v.m. was removed from the filter cloth to a tared beaker, dried, and weighed. The weights so determined were used as the measure of the amount of any particular kind of v.m. found, without making any attempt to correct for ash or extractives. These final weights were compared with the base weights of original bone-dry, ash-free, extractives-free v.m. The results are recorded in Table 1.

TABLE I

Percentage Recovery of Vegetable Matter by the Sodium Hydroxide Isolation Procedure

Type of vegetable matter	*Percentage recovery based on weights of v.m. without correcting for ash* %
Cockleburs	110.4
	108.9
	107.9
	109.1
Sandbur	112.2
	105.1
	105.3
	107.5
Spiral bur	105.1
	102.5
	109.2
	105.6
Alfalfa	103.6
	96.1
	100.7
	100.1
Straw	89.0
	83.7
	84.5
	85.7
Average	101.6
Average correction factor	0.984

It is interesting to note that in most cases the yield is greater than 100 per cent, indicating that there is a considerable quantity of absorbed NaOH on the isolated v.m. Only in the case of straw were low yields obtained. This is in general agreement with the results obtained upon straw as contrasted with other types of v.m. in the NaOH, NaOCl procedure.[1] The results obtained in Table 1 show a general tendency towards high recoveries of v.m.; therefore, it appears necessary to make use of the average correction factor shown at the bottom of Table 1. By the use of the yields for each type of v.m. shown in Table 1 and the average correction factor of 0.984, Table 2 shows the results that might have been found if samples of wool containing 1 per cent or 3 per cent of each of the types of v.m. indicated had been subjected to the NaOH isolation procedure. The indicated extremes of inaccuracy of —0.53 per cent in the case of straw and +0.31 per cent in the case of sandburs are relatively small and show that the method is rather accurate and useful. Straw is generally a minor constituent of v.m. in wool and hence errors of the magnitude of —0.53 per cent as found with straw alone are not to be generally expected. An additional point is that domestic wools generally have a yield of less than 50 per cent so that errors in determination of v.m. content will generally have an error effect of less than 50 per cent of their value when applied to a clean wool yield determination on domestic wool.

TABLE II

Theoretical v.m. Contents of Wool Tested, based on Percentage Recoveries of Table I and the Correction Factor of 0.984

Type of v.m.	*V.M. content that theoretically would have been found in wool samples at* 1% *V.M. level*	3% *V.M. level*
Cocklebur	1.09	3.26
	1.07	3.21
	1.06	3.19
	1.07	3.22
Sandbur	1.10	3.31
	1.03	3.10
	1.04	3.11
	1.06	3.17
Spiral bur	1.03	3.10
	1.01	3.03
	1.07	3.22
	1.04	3.12
Alfalfa	1.02	3.06
	0.95	2.84
	0.99	2.97
	0.99	2.96
Straw	0.88	2.63
	0.82	2.47
	0.83	2.49
	0.84	2.53

In the NaOH isolation procedure as described, it is found that the materials isolated are not always vegetable in nature. Thus pieces of skin, taggy portions, and hard pieces of paint often are filtered off and isolated along with v.m. It seems well to point out that since these materials are impurities in the wool and since only a slight proportion of their weight is estimated by the ash and extractives tests run in a clean content determination, it is proper to weigh them in with the isolated v.m. A good indication of this is given by the following results which were obtained by an analysis of the findings of the ash test, the extractives test, and the v.m. test when run upon the hard taggy portions as found in some scoured wools. On a specific amount of hard tags, the v.m. isolation procedure yielded 67.6 per cent of the bone-dry weight, the extractives test yielded 5.7 per cent, and the ash test yielded 22.4 per cent. It would appear that the greatest portion of tag impurities is rendered by the v.m. test, and that the three analytical tests combined come close to giving a complete picture of the amount of tag impurities present. It would also appear that it is essential in any determination of the clean content of wool to make a determination of the amount of tags present and that this would most conveniently fall in the v.m. determination. The NaOH isolation procedure does this rather easily. Special attention might have to be given to tags in any transparizing procedure.

Conclusions

A method for determining v.m. in wool consists of adding to a 20-gram sample of wool, 400 mls. of boiling 10 per cent NaOH, letting the sample stand for 2 or 3 minutes, then diluting it with approximately 500 mls. cold water, filtering off the v.m., washing with water, washing with 5 per cent NaOCl, washing with water, drying, and weighing. The method is quick and fairly accurate. It, together with the ordinary extractives and ash tests, approximates rather well the quantity of hard taggy matter found in some samples of scoured wool.

References

[1] G. C. LeCompte, Amer. Dyestuff Reptr. 34, 469-73 (1945).
[2] M. Lipson, J. Proc. Roy. Soc. N.S. Wales 76, 225-8 (1943).
[3] H. J. Wollner, L. Tanner, and I. Michelson, Amer. Dyestuff Reptr. 33, 375-8 (1944).

Silver Jubilee Issue
A.A.T.C.C.-S.C.C.M.
December 2, 1946

The Dyeing of Hosiery in Germany

THOMAS R. SMITH
OQMG Consultant

HOSIERY made of natural silk, mostly reenforced with mercerized cotton for stockings made of rayon and mercerized cotton are dyed in Germany mostly on mechanical dyeing apparatuses and only rarely in smaller lots by hand suspending on sticks. Two main types of mechanical dyeing apparatuses are being used:

1. Apparatuses similar to the Smith-Drum System—well known in America (rotating drum apparatuses).

2. According to systems in which the stockings are suspended on sticks by means of threads passed through their heels. They are being moved with these sticks mechanically through the dyeing liquor to and fro (for instance system Weise, Chemnitz).

Hosiery made of natural silk was mostly dyed after having been boiled off and slightly purified. Also the stockings of rayon had to be cleaned before the dyeing. This was done by means of the usual cleaning agent on the basis of alcohol-sulfonates or fatty acid condensation products in connection with fat solvents.

1. Stockings made of natural silk with mercerized cotton

These hosiery were dyed in neutral dyeing liquors. For this purpose substantive dyestuffs were used which do not dye the silk or just a little, and also in the same bath acid dyestuffs which do not dye the cotton. The most important dyestuffs of this type which were used in Germany are:

Substantive dyestuffs:

Sirius Light Yellow R extra
Sirius Orange 3R
Sirius Light Scarlet B
Sirius Pink G
Benzo Light Brown BR
Sirius Light Brown BRS
Diamin Fast Brown GB
Benzo Light Brown STR
Benzo Deep Brown BR
Diaminkatechin B
Diamin Bronze Brown PE
Diazo Light Brown BM
Sirius Black L

SINCE hosiery has been mostly dyed in Saxonia of the Russian occupied zone, and no visits were made to the Russian Zone, it was impossible to inspect hosiery dyeing plants in Germany. However, Dr. E. Koester of the I. G. Farben Works at Leyerkusen was interviewed and the accompanying report by Dr. Koester is submitted as a summary on the subject.

Acid dyestuffs:

Fast Silk Yellow G
Acid Anthracene Brown 3 BL
Supranol Red BR
Supranol Brown 3GL
Supranol Brown 5 R
Wool Fast Blue FFG
Sulfoncyanin 6R extra
Silk Fast Grey BB
Supamin Black BR

2. Hosiery of viscose rayon and mercerized cotton

The most important dyestuffs used for this purpose in Germany are:

Cotton Yellow R
Sirius Light Orange GGL
Sirius Light Orange 3R
Benzo Fast Orange WS
Diamin Fast Brown G
Benzo Fast Scarlet 4BA
Triazolkorinth B
Dianil Brown AR
Benzo Light Brown BRS
Sirius Light Brown BRS
Benzo Deep Brown BR
Benzo Light Brown STR
Naphtamin Brown BTL
Benzo Deep Brown R
Benzo Deep Brown G
Pegu Brown GN
Diamin Bronze Brown PE
Naphtamin Fast Grey BR
Benzo Light Grey BM
Diamin Deep Black CRN
Diamin Deep Black SS

3. Stockings of Nylon (Perlon)

Hosiery of this quality has practically been dyed in Germany only rarely as nylon was not available and Perlon had been exclusively used for other purposes. As far as we know stockings made of nylon— which had been produced by Messrs. Rhodiaseta at Lyon—have been dyed in France to a larger extent. Experiments made in Germany with Perlon, and in France with nylon, show that dyestuffs for acetate silks like Celliton and Celliton Fast dyestuffs are best suited for this purpose. They are better levelling and if the dyestuffs are well selected, dyeings of satisfactory fastness will be produced.

Acid dyestuffs for wool, though they may exhaust quite well as single dyestuffs, are less suited when two or more are used in combination, because it is very difficult to find convenient combinations of such acid dyestuffs which will uniformly exhaust and level sufficiently.

Practical experience shows that as a rule it will be necessary to steam the stockings under pressure at about 110-120° C. in order to avoid creasing and shrinking. Sometimes, however, it has proved sufficient to steam the stockings at about 100° C. during approximately 20 minutes. This method has given also quite satisfactory results.

The dyeing is made by means of the above mentioned Celliton dyestuffs in a neutral bath with the addition of 1 or 2 gr. of soap or Igepon TS or other dispersing agents.

The following dyestuffs have been chosen and proved as especially suitable for Perlon and nylon:

Celliton Fast Yellow G
Celliton Fast Yellow RR
Celliton Fast Brown 3R
Celliton Scarlet B
Celliton Fast Blue FFB
Celliton Fast Blue FR Conc.

For instance the following dyestuffs have been used in combinations:

Celliton Fast Yellow RR
Celliton Scarlet B
Celliton Fast Blue FFB
Celliton Fast Yellow G
Celliton Fast Brown 3R
Celliton Fast Blue FR conc.

Grey shades:

Celliton Fast Yellow RR

Celliton Scarlet B

Celliton Fast Blue FFB

Black shades on Perlon have been dyed with:

Cellitazol STN conc.,

diazotized with 3 g of sodium nitrite per liter and 8 cc. hydrochloric acid 20° Be per liter during 45 minutes at 20°C. and developed with 6% Developer CNL during 1 hour at 60°C.

Hot Water Heating of Dye Liquor

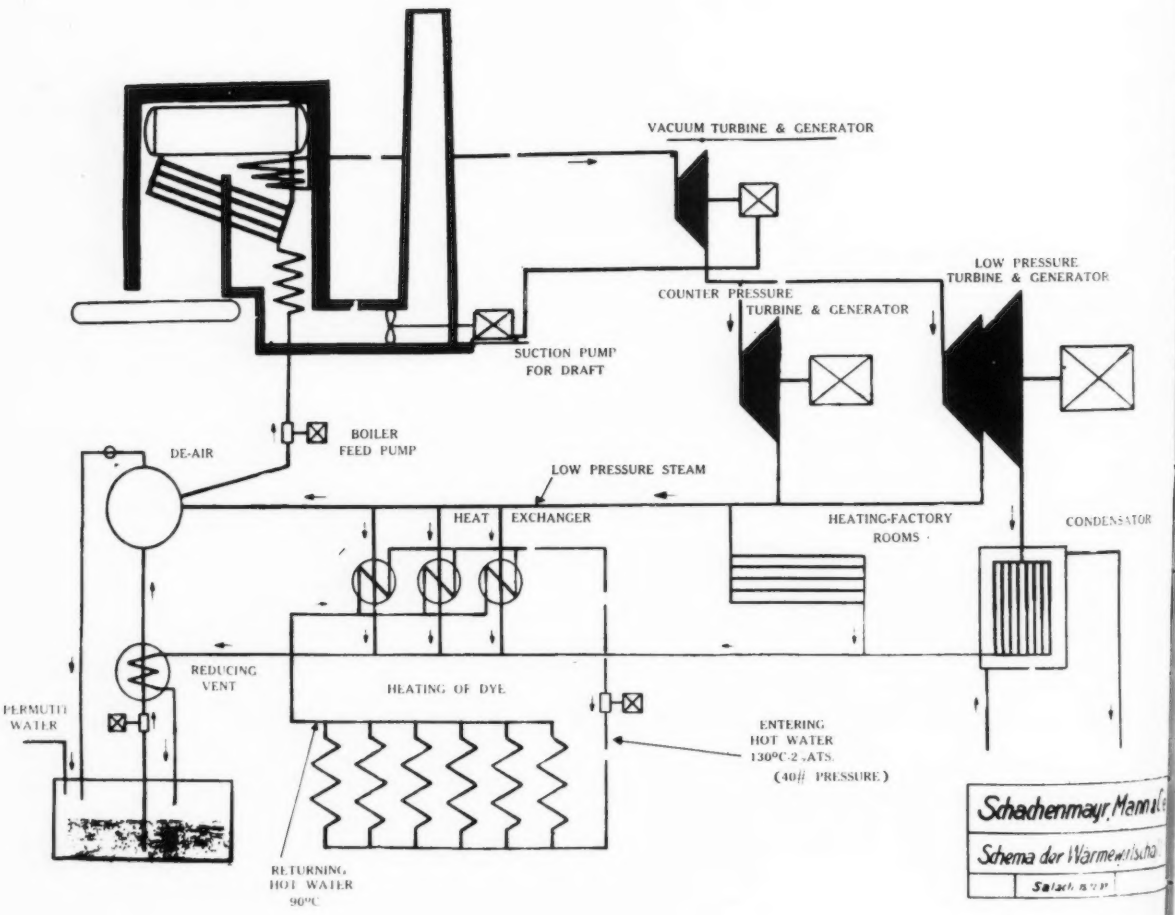
THOMAS R. SMITH

OQMG Consultant

THE plant of Schachenmayr, Mann & Cie, Salach Wertenburg near Stuttgart, woolen yarn spinners and dyers was investigated in October and November, 1945, and Mr. Van Ostermann, the manager, explained the hot water system used for heating dyeliquor. The principle of the system as shown by the sketch is for high pressure steam to be used in a series of turbines to generate power passing on as low pressure steam into a series of 3 heat exchangers where water is heated to 130° C. and pumped at a pressure of 40 pounds through closed coils in the various dyeing machines. The hot water is recirculated through the heat exchanger and the low pressure steam returns to the boiler as condensate.

The low pressure steam is also used for heating the buildings and factory rooms, and the low pressure steam returns to the boiler as condensate.

etc. The hot water is dyed with a soluble red dye in order to discover leaks in the system as soon as they develop. Mr. Van Ostermann claimed savings in fuel with this system, and with the shortage of fuel in Germany this factor is most important, whether the system is more economical than conventional ones used in the United States is questionable. The sketch traces the steam from the boilers until it returns as condensate.



Proceedings of the
American Association of Textile Chemists and Colorists

NOVEMBER 4, 1946

Officers of the Association

WILLIAM D. APPEL, *President*
National Bureau of Standards, Washington, D. C.

HUGH CHRISTISON—HENRY F. HERRMANN, *Vice-Presidents*

WILLIAM R. MOORHOUSE, *Treasurer*
National Aniline Division. Allied Chemical & Dye Corp., Boston, Mass.

HAROLD C. CHAPIN, *Secretary*
Lowell Textile Institute, Lowell, Mass.

LOUIS A. OLNEY
President Emeritus and Chairman of the Research Committee
Lowell Textile Institute, Lowell, Mass.

HAROLD W. STIEGLER
Director of Research
Lowell Textile Institute, Lowell, Mass.

COUNCILORS

Representing Sections

HOWARD V. KING; ALLISON R. FLETCHER; HAROLD B. STURTEVANT (Rhode Island)

JAMES P. CONAWAY; ARTHUR W. ETCHELLS; BOYCE C. BOND; PERCIVAL THEEL (Philadelphia)

PATRICK J. KENNEDY; ROY G. BUCK; LEONARD S. LITTLE; THOMAS F. O'BRIEN

GEORGE L. BAXTER; A. G. ASHCROFT (New York)

EDWARD S. CHAPIN; WALTER J. HAMBURGER; DELBERT E. RAY (N. New England)

SIDNEY M. CONE; RAPHAEL E. RUPP; SAMUEL L. HAYES (Piedmont)

W. B. GRIFFIN (South Eastern)

MAX Y. PARKER (South Central)

HERBERT W. TETZLAFF; ARTHUR T. BRAINERD (Midwest)

Past Presidents

ELVIN H. KILLHEFFER; P. J. WOOD; ROBERT E. ROSE; WILLIAM H. CADY; ALBAN EAVENSON; CARL Z. DRAVES; THOMAS R. SMITH

Standing Committees of the Council and their Chairmen

Executive Committee on Research
Leonard S. Little, Chairman

Publicity
Winn W. Chase, Chairman

Appropriations
William R. Moorhouse, Chairman

Membership and Local Sections
Hugh Christison, Chairman

Constitution and By-Laws
Harold C. Chapin, Chairman

Corporate Memberships
Henry F. Herrmann, Chairman

Publications
Louis A. Olney, Chairman

Local Sections and Their Officers

Northern New England Section

George O. Linberg, Chairman, E. I. du Pont de Nemours & Co., Inc.
140 Federal St., Boston 10, Mass.
Azel W. Mack, Secretary, Dexter Chemical Corp.
581 Boylston St., Boston 16, Mass.
Frank J. Rizzo, Vice-Chairman; Martin H. Gurley, Jr., Treasurer

Rhode Island Section

George H. Wood, Jr., Chairman, 40 Valentine Circle, Apponaug, R. I.
James C. Shore, Secretary 324 Weeden St., Pawtucket, R. I.
Robert W. Joerger, Vice-Chairman; Robert R. Farwell, Treasurer

New York Section

Dr. Herman E. Hager, Chairman, General Dyestuff Corp.
435 Hudson St., New York 14, N. Y.
Norman A. Johnson, Secretary American Dyestuff Reporter
One Madison Ave., New York 10, N. Y.
Charles W. Dorn, Vice-Chairman; John H. Hennessy, Treasurer

Philadelphia Section

Curt R. Baeringer, Chairman, 5936 Castor Ave., Philadelphia 24, Pa.
A. E. Raimo, Secretary, John Campbell & Co., S. E. Corner Broad and Spring Garden Sts., Philadelphia 23, Pa.
Walter F. Fancourt, Vice-Chairman; Arthur M. Gordon, Treasurer

Piedmont Section

Leland C. Atkins, Chairman, Southern Dyestuff Corp., Charlotte, N. C.
John B. Neely, Secretary, Burlington Mills, Yarn Dyeing Div., Burlington, N. C.
Wyss L. Baker, Vice-Chairman; Roy J. Beauregard, Treasurer

South Central Section

Clyde J. Horne, Chairman, Dixie Mercerizing Co., Chattanooga, Tenn.
Allan James Nelson, Secretary, Springfield Woolen Mills Co., Springfield, Tenn.
W. K. Newman, Vice-Chairman; Bernhard Borrman, Treasurer

Midwest Section

Al. J. Feit, Chairman, E. I. duPont de Nemours & Co., Inc.
7 S. Dearborn Street, Chicago, Ill.
George B. Chabot, Jr., Secretary, Calco Chemical Division,
American Cyanamid Co., 146 W. Kinzie Street, Chicago, Ill.
George E. Osha, Vice-Chairman; Joseph H. Jones, Treasurer

South-Eastern Section

A. Kempton Haynes, Chairman, Rohm & Haas Co., Inc., 1811 Meadowdale Ave., N. E., Atlanta, Ga.
Howard M. Waddle, Secretary, West Point Mfg. Co., Shawmut, Ala.
Matthew T. Barnhill, Vice-Chairman; Allyn J. Morse, Treasurer

STUDENT CHAPTERS

Lowell Textile Institute
North Carolina State College
Philadelphia Textile Institute
New Bedford Textile Institute

Members should notify the Secretary immediately of all address changes

Control of Shrinkage and Crease Resistance of Viscose Rayon Fabrics*

H. F. CREEGAN

Dyeing & Finishing Division, Textile Research Department, American Viscose Corporation

RAYON, since the first commercial yarns were produced in this country in 1911, has been in increasing demand by the textile trades and the consuming public. This has been particularly true of rayon staple since its introduction to this country after World War I. This increasing demand for rayon has continued in spite of several faults which rayon admittedly has, and which the rayon producers are the first to recognize. Not the least of these faults is the tendency of rayon fabrics to shrink when laundered, particularly if the fabric has been improperly made and mistreated in dyeing and finishing. It is with this problem of shrinkage, the application of the various processes for its control, that this paper is chiefly concerned. However, since both shrinkage control and crease resistance are obtainable with thermosetting resins such as urea formaldehyde and melamine formaldehyde, this property of crease resistance will also be considered when discussing the resin applications.

Causes of Shrinkage

But to return to the problem of shrinkage. What causes it? The causes of shrinkage, particularly of the progressive shrinkage which occurs on successive launderings, are undoubtedly quite complex. Experimental work is still being carried out to attempt to unravel some of these mysteries. There are several factors, however, which we can lay our finger on, that certainly are large contributors to rayon shrinkage.

One factor, and an important one, is the ability of regenerated cellulose to take up water and the subsequent swelling which occurs. The rayon fiber, when thoroughly wet out and hydro extracted may retain as high as 100% of its own weight in moisture. The swelling which occurs in this wet state, while only 1% to 2% in length, may be as high as 60% in cross sectional area. Now when any rayon fabric, which has not been previously relaxed, is wet out, the fabric, due to the displacement caused by the cross sectional swelling of the yarns, draws up in length and width. When this same fabric is allowed to dry relaxed, it will be noticed that further shrinkage takes place. This shrinkage which takes place between the wet and dry state seems to be caused by the release of strains inherent in the individual fiber from tensions applied to the yarn or fabric during processing. The progressive shrinkage which occurs in viscose rayon fabrics may be due to the fact that the individual fibers in the fabric being obstructed, due to twist, fabric construction, etc., in their attempts to release strains, are continually shifting and moving during wetting and drying cycles, and are never able to release all of the strains in all the fibers.

Another extremely important factor which affects the shrinkage of rayon fabrics is the tendency of rayon to stretch when wet, and to retain this stretched condition if dried under tension. A fabric that has been so treated will, if subsequently wet out and dried relaxed, show considerable shrinkage for the reasons stated above. It, therefore, becomes necessary that the dyer and finisher be extremely tension conscious and take every precaution to reduce processing tensions to a minimum to obtain a finished fabric that has the least possible residual shrinkage. The increased fullness of hand which may be obtained in carefully handled fabrics is, in itself, well worth the trouble. I have samples here of mistreated and carefully treated spun viscose fabrics which adequately illustrate this difference. We would like to point out at this time the advantages of the overfeed pin tenter which is in common use in England. This machine, which allows overfeeding up to 15%, produces fabrics which have had an opportunity for complete shrinkage warpwise with control of width. In addition, the fabric as it comes from the pin tenter is naturally smooth and salable. There is considerable interest in this machine among finishers in this country, several machines having already been ordered.

There are three general methods which may be used by the finisher to obtain fabrics which show a reasonably permanent, low residual shrinkage. The first and best known method is by the application of synthetic resins of the thermosetting type; urea formaldehyde and melamine formaldehyde resins being the two resins used. It is our intention to outline the various steps in the application of these resins, pointing out where care is necessary to obtain good shrinkage control and crease resistance.

Use of Resins

Both urea formaldehyde and melamine formaldehyde resins are applied to the fabric from water solutions of the monomer, or precondensate, in the presence of a catalyst which will split off acid at the high temperature used for curing. The following formula is of sufficient strength to give crease resistance if properly applied and even in lower concentrations will yield fabrics of low residual shrinkage.

Urea Formaldehyde (dry)—30#
Diammonium Phosphate (catalyst)—1.2#
Wetting Agent—0.25#
Water to make—12 gallon

The urea formaldehyde precondensate is dissolved in 4 gallons of hot water, previously heated to 180° F. When thoroughly dissolved, 35# of cracked ice should be added to cool the solution as quickly as possible. The wetting agent is then added and the mixture diluted to 11½ gallon. The catalyst is dissolved in ½ gallon cold water and added to this mix just before padding.

Some finishers have preferred to manufacture their own urea formaldehyde precondensate. Although a reflux condenser is preferred to prevent loss of formaldehyde and the spreading of undesirable fumes through the plant, the following formula can be used in an open tank with success, providing the dyehouse has

*Presented at meeting, Philadelphia Section, September 27, 1946

a good ventilating system.

Commercial Formaldehyde 40%—5 gallons

Urea—15#

Diammonium Phosphate (catalyst)—1.2#

Water to make—12 gallon

Place formaldehyde in a mixing tank equipped with a closed coil connected to steam for heating and the cold water line for cooling. Neutralize to pH 7.0 with caustic soda, using a potentiometer to check the pH. Add the urea and stir until urea is dissolved. Then bring the pH to 8.9 to 9.0 with caustic soda. If the desired pH should be overshot, formic acid may be used to bring it back to the proper point. With constant stirring, bring the mixture to 175° F. in 20 minutes, and hold it at this temperature for 5 minutes. Then cool as quickly as possible to 70° F. In summer months it is advisable to use cracked ice to get the temperature down quickly. Now add to the cooled mixture 6 gallon of cold water, or less depending on the amount of ice used in cooling. The catalyst is dissolved in ½ gallon cold water and then added to this solution just before using.

This procedure is especially useful for finishers who are doing only relatively small quantities of resin work. Since the urea formaldehyde precondensate is quite unstable and must not be stored for too long a period before using, the finisher can make enough precondensate to finish the work on hand, and not be concerned about keeping a supply. The importance of fresh precondensate will be stressed later.

Melamine formaldehyde is made up for use in the same way as urea formaldehyde. The following formula is calculated to be of sufficient strength to give crease resistance. Dilution of this same solution by one-third will still give shrinkage control.

Melamine precondensate (80% solids)—16.0#

Diammonium Phosphate (catalyst)—.48#

Cold water to make—12 gallon

The resin and the catalyst are dissolved separately and then mixed, the mixture then being brought to 12 gallon with cold water. A wetting agent may also be used if the fabric is particularly difficult to wet out. All of the above resin formulas are based on 75% expression at the pad.

Application

Let us now consider each step in the application of these resins to viscose rayon fabrics; namely, padding on the resin, drying, curing, washing and the final drying and finishing.

It is generally conceded that if sufficient of either the urea formaldehyde or the melamine formaldehyde resins are applied to the fabric to obtain crease resistance, effective shrinkage control will also be obtained. Both of these desired results, are, however, very noticeably affected by the processing previous to the application of the resin. Generally speaking, it is important that the fabric be presented to the resin application in as relaxed a condition as possible. The importance of this point varies quite naturally with the construction of the fabric, but it should never be overlooked. This means that tensions throughout the scouring and dyeing operations must be held to an absolute minimum.

The effect of presenting a relaxed fabric to the resin application seems to be twofold. First, the warp and filling yarns are more open and are more easily wet out. There is literally more room for the resin. Since crease resistance depends on the resin being carried into the spaces between the molecular chains of the cellulose and there being polymerized to the high molecular weight, insoluble compound, this becomes an important factor. Secondly, the resin cannot be expected to do all the work in achieving shrinkage control. The lower the residual shrinkage of the fabric at the time of application of the resin, the easier it is for the resin to "set" the fabric. The tendency toward progressive shrinkage in successive launderings is also diminished.

I should like to point out at this time some results of a study made at the Textile Research Department, of the American Viscose Corporation. In order to study the effect of various machines on the fabrics run over them, several spun rayon styles, current on the market at the time, were obtained and subjected to a regular scouring and dyeing procedure; namely, desize, scour in the beck, dry, frame and vat dye, pad-jig, wash in beck and dry. Before being run through these processes the goods were yarded off accurately and 36" squares were marked out in the center of each piece. These measurements were then checked at each step, when practical, throughout scouring and dyeing, and subsequent resin treating.

Some interesting results were obtained. We found, for example, that no matter how carefully we avoided tension when steam framing our fabrics on the 30 foot clip frame, that we stretched the fabrics warpwise from 0.5% to as high as 4.25%. We also found when vat dyeing by the pad jig process, that even though we washed in the beck to obtain relaxation, after dyeing on the jig, we were never able to obtain the degree of working loss that we had obtained in the original scouring. It was obvious that the tensions applied during padding and reducing on the jig had stretched the fabric to such an extent that it could not recover in ordinary handling. This, of course, is the reason why spun fabrics dyed with vats by the pad-jig process usually have a thinner hand than those dyed in the beck with direct or developed colors. I mention this study to point out the importance of knowing what each machine in your plant is doing to the fabrics which are being processed on it. It is also interesting to note that these same fabrics, when resin treated, although showing reasonably good shrinkage control, were poor for crease resistance and had a harsh, stiff hand, due to surface resin.

Padding

To get on with the discussion of the various steps in resin applications, let us consider the padding on of the resin solution. This operation calls for its share of control. The degree of penetration achieved during padding has an important bearing on not only the crease resistance and shrinkage control, but also on the hand of the fabric. The final condensation product of both urea formaldehyde and melamine formaldehyde is a hard, brittle resin. If this resin is allowed to form on the surface of the fabric, a stiff, raspy hand is the result. If, however, this resin is formed within the fibers, namely, between the cellulose molecular chains, the result is a soft, resilient fabric.

The immersion time at padding should be sufficient to allow thorough wetting out. This is particularly true of fabrics made of high twist and plied yarns, such as tropical worsted types. An auxiliary box, in front of the usual two bowl pad is one way of achieving this desired penetration. The three bowl pad, laced to give a second immersion between first and second nips is also admirable. Pad pressures should be sufficient to insure a good squeeze, an expression of 75% to 80% being considered satisfactory.

At this time, let us take note of a few precautions in the making up of the resin solution for padding. When using urea formaldehyde, the finisher should bear in mind the relatively poor keeping qualities of both the resin as purchased, and of the solution made from this resin for padding. The resin, as purchased, when stored for any length of time, even at room temperatures, will undergo slow polymerization. The longer this polymerization continues the larger the molecular size becomes. As the molecular

size of the resin increases, even though still water soluble, the more difficult it becomes for the resin to penetrate the spaces between the cellulose molecules. We have already discussed the effect of penetration on the finished fabric. The stability of the resin solution once the catalyst has been added, is even more critical. It is important that the solution be used immediately upon addition of the catalyst.

There are several ways in which the instability of the resin solution can be minimized, although not entirely overcome. The most obvious is, of course, to refrain from adding the catalyst to the solution until everything is set to go ahead with the run. Another way is to keep the solution as cool as possible by the use of an ice packing around the mixing tank or by the use of a water jacket or cooling coils. An ideal set-up is to use cooling coils in both the mixing tank and the pad box.

Melamine-formaldehyde, as purchased, is more stable than urea formaldehyde. It can be stored for considerably longer periods at room temperature without danger of too much polymerization taking place. Care should be taken, however, to store it in as cool a place as possible. The same is true of the solution as made up for padding. Even after addition of the catalyst, it will be usable after several hours. The same precautions which are taken for urea-formaldehyde do no harm, however, and certainly increase the margin of safety.

Drying

The drying operation, following padding on of the resin solution, is an important phase in the process. Warp tension should be held to an absolute minimum by drying in a loop or Airlay dryer. Here again, the overfeed pin tenter, which is always used in England for drying on of resin applications, is a desirable machine. Anyone who has seen samples of English crease resist work will be forced to agree that they excel in this process. Our men, who have visited England, report that the English finishers give the overfeed pin tenter no small measure of credit for their success.

Another point to be considered during drying is migration. If the drying conditions are such that the surface of the fabric dries quickly, while the inside is still damp, the soluble resin will follow the moisture in migrating to the surface by capillary action. This surface resin will give a harsher hand and will reduce the effectiveness of the treatment as has already been noted. We believe that the best conditions for drying are low temperature, preferably in the neighborhood of 180° F., with 200° being a maximum temperature. Mention of low drying temperature naturally raises the question of what happens to production. It is quite true that dryer speeds must be reduced to dry the fabric at these lower temperatures. However, a stack of cans or a roller dryer may be used in tandem with the slack dryer which will remove up to 50 per cent of the moisture, and when followed by the overfeed pin tenter or the commoner type of slack dryer, will allow the necessary relaxation. This procedure is in common use in England, and has been applied in this country in conjunction with a loop or Airlay dryer.

Curing

Following drying, resin treated fabrics must be cured to achieve polymerization of the resin monomer to the insoluble form. Although curing for 5 minutes at 300° F. is a good all around procedure to follow, the best conditions of time and temperature for curing should be determined by each mill, for each fabric. Too low a temperature or too short a time will not allow complete polymerization of the resin. Too high a temperature for too long a period of time will increase the chances for damage to the rayon with subsequent loss of tensile strength and abrasion resistance. Insufficient curing may also allow the finished fabric to develop an extremely unpleasant "fishy" odor. The curing operation may be done in the loop, Airlay, or roller type dryer. Although tension is not as critical at this point as in the drying, it should be held to a minimum to obviate stretching of the fabric before the resin is cured.

Washing

The last step before final drying is to wash the cured fabric to remove excess chemicals and surface resin. This is best carried out in the beck to give the fabric a final chance to relax. Soap or synthetic detergents of the sulfated fatty alcohol type are used with additions of soda ash, tetra sodium pyprophosphate or other mild alkalis. The bath should be kept alkaline, since the application and curing of the resin leaves the fabric in a decidedly acid condition. The temperature of the wash varies from 120° to 160° F., depending on the fastness of the dye job, and is generally carried out for 15 to 20 minutes. The washing also serves to remove any incompletely polymerized resin, one of the chief contributors toward the development of "fishy" odors on the finished goods.

Final Drying

Although extracting and opening should be carried out as carefully as possible, the operation need not be confined to centrifuging and hand opening. Mechanical opening and suction slot extracting may be used providing the final drying is such as to allow relaxation of the fabric. Once more the overfeed pin tenter can enter the picture as an ideal dryer in obtaining this needed relaxation. This does not mean that the loop or Airlay dryer does not allow sufficient relaxation. The important point is that goods from the pin tenter are finished, whereas those from the loop or Airlay dryer require steam framing to be made salable, and this framing, even under the best of conditions, may stretch the fabric warpwise and reduce the degree of crease resistance and shrinkage control.

Discussion of Resins

This paper has emphasized to date the important points of control at each step in resin application. You will note that relaxation and control of tension has been consistently stressed. In this connection we would like to point out that batching up after any of these operations can have a tremendous effect on the result. To insure a minimum of tension during batching it is best ot fold loosely into a box rather than to batch on a roll. This method has the advantage of allowing complete relaxation and even tension both when batching and when running into a succeeding machine. In our resin work at the Textile Research Department, in Marcus Hook, we have found it to be a definite advantake to flat fold, even after padding on the resin solution. We do not recommend this procedure for production runs, since lay marks would develop. It is possible, however, to pad and dry continuously, maintaining a slack between pad and dryer.

It might seem to the practical finisher that we have so surrounded these resin applications with restrictions as to make it almost impossible for the finisher to obtain good crease resistance or shrinkage control with the thermosetting resins. Admittedly, in our work at the Textile Research Department, we have been "shooting for the moon." However, it is surprising what can be done with regular equipment, merely by attention to detail, to improve the quality of resin work. By a little simple engineering a reasonably good continuous set-up can be rigged up for application of these resins, frequently with equipment already at hand.

These resin treatments are well known

to the trade for the properties which they give to rayon fabrics; namely, crease resistance and/or shrinkage control. Both properties are obtained by reason of the fact that it is possible to form an insoluble compound within the individual fibers. Both urea and melamine formaldehyde types will produce the desired effects. As a rule lower add-ons of melamine may be used to obtain effective shrinkage control than when using urea formaldehyde. In the work which we have done at the Textile Research Department, we have usually obtained better crease resistance and softer hand with urea formaldehyde. This is probably due to the fact that melamine formaldehyde seems to be more susceptible to migration during drying so that more surface resin is likely to develop with this product.

A point to consider when using these resins is the fact that urea formaldehyde is more easily removed from the fabric than melamine formaldehyde if it is necessary to redye after finishing. The urea formaldehyde polymer is soluble in warm dilute hydrochloric acid, whereas melamine formaldehyde is only slightly soluble. However, the need for redyeing after finishing should be eliminated by thoroughly inspecting the fabrics before application of the resin.

Although effective shrinkage control may be obtained with these resins, one undesirable feature has held back their use for certain launderable fabrics; namely, their ability to retain chlorine when subjected to a chlorine wash in laundering. This chlorine will cause a yellowing of the resin to the impairment of whites or pastel shades and give poor wearing qualities due to damage to the fabric. The fact that the simple use of an antichlor will eliminate this danger has not been sufficient to remove the danger since the commercial laundries cannot be depended on to use an antichlor. Urea formaldehyde is the worst offender of the two types of resins from the chlorine retention angle but melamine formaldehyde is not entirely blameless. Substituted melamines have been offered to the trade which have tended to reduce the chlorine retention, but the problem has not yet been completely solved. There is hope, however, that a resin of the melamine type will be made available that will have no tendency to retain chlorine.

"Definized" Process

Let us leave the resin applications and pass on to a second process, which has been recently developed to achieve shrinkage control. This is the "Definized" process, developed by the Alrose Chemical Company, of Cranston, Rhode Island, and now being marketed by the Aqua-Sec Corporation. The process in itself is relatively simple, consisting in the main of the application of caustic soda of high concentration to the greige goods, followed immediately by neutralization of the caustic soda. The fabric is then scoured and dyed in the usual manner. This apparent simplicity should not be allowed to throw the finisher off guard, however, since careful control is as necessary with this process as with the resin applications.

Let us consider this process in more detail. The first step is the application to the greige fabric of a protective agent which is sold under the name of "Alrozone." This material comes in paste form and is diluted with 9 parts of water and applied on a padder at 140°-150° F. The padded goods are then dried on a tenter frame at greige width. This framing to greige width is necessary to maintain the finished width of the fabric through later operations. Care should be taken during frame drying to allow at least some warp shrinkage to take place else the hand of this finished fabric may be thin due to low pickage. One should also be careful in padding on the "Alrozone" that an excessive amount of the material is not left on the fabric, which might, when the caustic is applied, retard the action of the caustic and prevent stabilization.

The next step is really a combination of three operations; namely, application of the caustic, neutralization of the caustic and rinsing. Caustic soda of 40 per cent concentration is applied on a padder at 80° to 100° F. with the pickup adjusted to 90 per cent. The fabric is then skied for from 5 to 30 seconds and passed into a neutralizing bath containing 5 per cent to 10 per cent sulfuric acid, depending on the volume of liquor of the neutralizing bath, and the length of time that the fabric is exposed to the acid. Neutralization is followed by hot water rinsing, and a passage through soda ash to neutralize any excess acid.

Now, this step, of causticizing and neutralizing is the heart of the process. It is here that shrinkage control is obtained and also the point where it is possible to do the most damage to the viscose fabric. It cannot be too strongly stressed that neutralization must be carried out with the greatest dispatch. The strength of the neutralizing bath must be such that there is no gradual neutralization of caustic soda, but an almost complete and immediate neutralization. If neutralization is slow, a harsh hand and reduction of tensile strength will almost surely occur, since it is at lower concentrations that caustic is most reactive toward regenerated cellulose.

It is for this reason that the causticizing and neutralizing operations are best carried out in a continuous, open width manner. Samples have been successfully run by padding on the caustic, batching on a roll, and neutralizing in the jig, but on production runs this practice is not advisable if consistent results are to be obtained, and if a soft supple hand is desired.

Steps may be taken at this point to control both the width of the fabric and the total working loss. By using expander rolls just before the neutralizing bath the fabric width can be held out, and by applying warpwise tension at this point, working loss may be varied, and still obtain stable fabric. However, the finisher should bear in mind that the hand of the finished fabric will be affected by the number of ends and picks per inch.

It is worth mentioning that when the "Definize" process was first attempted in commercial trials that 30 per cent caustic at 120° F. was employed, neutralization being done with sodium bicarbonate. Sodium bicarbonate neutralization had the advantage of leaving the fabric still in an alkaline condition, the caustic being converted to soda ash by the bicarbonate, and making it possible to go direct to the scouring bath with nothing more than a cold rinse. Recent developments have shown, however, that the 40 per cent caustic is less apt to lower the tensile strength of viscose rayon fabrics and that sulfuric acid is a more convenient neutralizing agent; and, of course, cheaper than bicarbonate.

Following this treatment the rayon fabrics are desized if necessary, and scoured and dyed or printed in the usual manner. Opening and extracting may be done mechanically but should always be followed by relaxed drying in the loop or Airlay dryer.

Before finish framing, a modified CCC-T-191a cotton shrinkage test should be run to determine the proper width. In the modified test, the sample being tested is centrifuged after rinsing and immediately dried on the flat bed press, eliminating the slack drying, followed by sprinkling, and then flat bed press drying. The fabric should then be framed to ½" to 1" wider than the wash width, depending on the type of fabric, to allow the goods to finish up at the washed width shown by the shrinkage test. The fabric may then be subjected to calendering or decating or both providing these operations are carried out with a minimum of tension.

This process, when properly controlled, may be applied to viscose rayon fabrics

and fabrics containing viscose rayon and cotton. When the precautions already mentioned are followed, fabrics may be produced with little loss in tensile strength, good hand, and which will show low residual shrinkage over quite a number of washings. Chlorine retention is, of course, no problem with this process.

Rayon Stabilization Process

The third and most recently announced process for stabilizing viscose rayon fabrics is Cluett Peabody's "BR-1 Rayon Stabilization Process." This process was described in a paper presented by Dr. Jack Epelberg, of Cluett's Research and Development Division, before the June 5th, 1946 meeting of the A.A.T.T., and has been published in the July 15, 1946, issue of the American Dyestuff Reporter under the title "Some Recent Developments in Rayon Stabilization." In this paper, Dr. Epelberg describes the application of glyoxal, together with an acid catalyst, to rayon fabrics to achieve stabilization. We should like to discuss this process step by step as we have already done with resin applications and the "Definize" process.

The previously boiled-off and dyed goods are padded through a solution of glyoxal and an acid catalyst. Care should be taken to allow sufficient immersion time, either by use of an auxiliary box or skying roller, to allow thorough penetration of the fabric. The pad should be set to give an expression of about 100 per cent. The goods are then dried on a housed tenter frame, care being taken that the fabric, as it comes from the tenter frame, be just dry, so that no curing can take place during drying.

The curing operation comes next and is best carried out in the loop or Airlay dryer. The curing conditions may be adjusted as to time and temperature to suit the individual machine. The dryer, however, should be equipped with a good temperature regulator, so that the temperature of the dryer can be carefully controlled. This is necessary to avoid over or under curing. The fabric should be either cooled over cooling cans or some skying arrangement, or else should be wet out immediately after curing.

Following curing the goods should be washed to remove excess chemicals and to neutralize the acidity of the fabric. This should be done in relaxed form in the beck or continuous washer in an alkaline bath. The goods are then opened and extracted on the suction slot, or centrifuged and opened by hand.

The drying of these fabrics should always be done in a relaxed condition, preferably in the loop or Airlay dryer. The finish framing should be done only after making a preliminary wash test to determine the proper finished width. Decatizing or calendering may follow the framing if necessary for finished hand, but warp tension should be held to an absolute minimum.

Rayon fabrics, when properly treated by this process, show excellent shrinkage control when subjected to repeated launderings. Although there may be some loss of tensile strength, such loss can be held to a minimum with proper control of curing conditions. An interesting result has been observed in tests on glyoxal treated fabrics in regards to tensile strength. Even though the tensile strength of glyoxal treated fabrics may be somewhat less than an untreated control, it has been found that when both are subjected to multiple launderings, the strength of the untreated sample drops at a considerably greater rate than the glyoxal treated sample, and will before too many launderings, drop to a lower strength than the glyoxal treated sample. Also when tested against untreated samples on the Taber Abraser the glyoxal treated goods will show a noticeable loss in abrasion resistance. However, when these same fabrics are made into collars and subjected to multiple launderings, the untreated samples show signs of wear before the treated ones.

This process may be applied to fabrics made of viscose rayon or blends with acetate rayons providing that the viscose fiber constitutes the major portion of the blend. The process is not considered applicable to fabrics containing cotton because of the tendency of the acid catalyst to tender the cotton fiber at the temperatures used for curing.

The "BR-1 Rayon Stabilization Process" stabilizes viscose rayon fabrics by chemical reaction between the cellulose of the fiber and the glyoxal. There is no danger of chlorine retention, therefore, it is particularly applicable to whites. There is a slight yellowing of the fibers with this process which, however, is easily removed by a chlorine bleach. Fabrics which would normally require bleaching should, therefore, not be bleached until after the application of the glyoxal.

Conclusion

We have discussed here three methods by which shrinkage control may be obtained. An attempt to compare these processes and select a preferred method leaves one at a loss. Each process has its advantages and its limitations. All require care and study when applying them to rayon fabrics. Therefore, it seems that each process has a place in rayon finishing, and that any finisher would be well advised to be acquainted with all three. Most certainly the growing use of vat colors, and the development of continuous methods of dyeing vat colors on rayon fabrics, will increase the demand for shrinkage control work to produce truly launderable rayon garments.

At the risk of becoming tiresome, if we have not already done so, we should like to again stress the need for control in all of these processes, and the need for attention to warp tensions. We would suggest, as a help in studying and controlling tensions, the use of measured marks, along the selvedge of fabrics being treated, which may be checked from operation to operation.

In closing it is only fair that credit be given where it is due. The entire staff of the Dyeing and Finishing Division, of American Viscose Corporation's Textile Research Department and the members of our "Crown" Tested Department, have contributed, through experimental work in our own dyehouse, and trade experience, to the information which this paper contains. We are also grateful to both the Alrose Chemical Company and to Cluett Peabody and Company, Inc., for their permission to discuss their respective processes.

CALENDAR OF COMING EVENTS

NEW YORK SECTION

Meetings: November 22, January 31, March 7, May 2.

RHODE ISLAND SECTION

Meetings: November 22, January 24, February 28, March 28, April 25. (Providence Engineering Society Hall, 195 Angell Street, Providence.)

PHILADELPHIA SECTION

Meetings: November 15, January 17, February 28, April 11, May 23.

NORTHERN NEW ENGLAND SECTION

Meetings: January, March, April, May
Outing: June.
(Dates to be announced)

NATIONAL CONVENTION

Silver Jubilee Convention: December 12, 13 and 14. (Hotel Statler, Boston.)

SUB-COMMITTEES

Meetings: December 12. (Hotel Statler, Boston.)

INTERSECTIONAL CONTEST

December 13. (Hotel Statler, Boston.)

RESEARCH COMMITTEE

Meeting: December 14. (Hotel Statler, Boston.)

Speakers, Committees, Papers and Judges Announced for the Intersectional Contest

PATRICK J. KENNEDY, Chairman of the Intersectional Contest Committee, has announced the following papers, speakers, committees and judges of the various sections who will participate in this year's contest to be held on December 13th in connection with the Silver Jubilee Convention at the Hotel Statler in Boston:

Rhode Island Section

Chairman of Contest Committee:
Alden D. Nute, American Cyanamid Company

Contest Committee:
George Wood, Apponaug Company
Harold Sturtevant, Hart Products Corp.
Peter Kolupaev, Slatersville Finishing Co.
James Shore, U. S. Finishing Co.
Herbert Travis, Rohm and Haas Co., Inc.
Edmund Tarnuzzer, Stein, Hall & Co.
Carl Medde, Lorraine Manufacturing Co.
Fred Tripp, Mount Hope Finishing Co.
Herman Allen, Sayles Finishing Co.
Gerald Stackpole, Cranston Print Works

Title of Paper:
"The Replacement of Starch in the Treatment of Textile Fibers and Fabrics."

Judge:
William H. Cady, Queen Dyeing Co.

Speaker:
Alden D. Nute

Philadelphia Section

Chairman of Contest Committee:
Dr. Miles A. Dahlen, E. I. duPont de Nemours & Co., Inc.

Contest Committee:
Prof. P. Theel, Philadelphia Textile Institute
Arthur Etchells, Hellwig Dyeing Corp.
Dr. H. Tucker, John B. Stetson Co.
Paul Meunier, E. I. duPont de Nemours & Co., Inc.
Richard Stehle, Allegheny Dye Works
William Ebersold, James Lee & Sons Co.
Dr. Glen Hiers, Collins & Aikman
R. Thomas, E. I. duPont de Nemours & Co.
James Coyne, Geo. S. Coyne Chemical Co., Inc.
M. H. Klein, Sandoz Chemical Works, Inc.
Dr. Fred. Bonnet, American Viscose Corp.
Dr. E. C. Dreby, Scholler Bros., Inc.

Title of Paper:
"The Effect of Dyestuffs on the Temperature Rise of Fabrics Exposed to Light"

Judge:
Prof. P. Theel

Speaker:
Dr. Miles A. Dahlen

Piedmont Section

Chairman of Contest Committee:
Peter S. Gilchrist, Jr., Charlotte Chemical Laboratories, Inc.

Contest Committee:
Norris Rabold, Union Bleachery
E. A. Briggs, Southern Franklin Process Co.
James Grant, Calco Chemical Division, American Cyanamid Co.
George Jones, Calco Chemical Division, American Cyanamid Co.
Mr. Ellis, General Dyestuff Corp.
Mr. Trexler, General Dyestuff Corp.
William Williams, General Dyestuff Corp.
John Killheffer, E. I. duPont de Nemours & Co., Inc.
Thomas Nuchols, Ciba Company, Inc.
James Grier, American Aniline Products Co.
Mr. McKenzie, National Aniline Division, Allied Chemical & Dye Corp.
Dyer Moss, Dyer S. Moss Co.
R. H. Baker, Mooresville Cotton Mills
Clarence Hooper, Burlington Mills
Charles B. Ordway, Burlington Mills
Thomas R. Smith, Wiscassett Mills Co.
Lawrence Wyss, Threads, Inc.

Title of Paper:
"An Evaluation of the Kupensauer Process"

Judge:
R. Hobart Souther, Proximity Manufacturing Co.

Alternate Judge:
A. Henry Gaede, Laurel Soap Mfg. Co.

Speaker:
Norris Rabold

New York Section

Chairman of Contest Committee:
Werner von Bergen, Forstmann Woolen Co.

Contest Committee:
Dr. Hugo Ehrhardt, Botany Worsted Mills
Claude Clutz, Forstmann Woolen Co.
Daniel P. Knowland, Geigy Co., Inc.
Henry E. Millson, Calco Chemical Division, American Cyanamid Co.
Arthur N. Patterson, S. Stroock & Co., Inc.
Harold S. Dahlberg, Alexander Smith & Sons Carpet Co.
William A. Holst, National Aniline Division, Allied Chemical & Dye Corp.
Dr. Hans Luttringhaus, General Dyestuff Corp.

Advisory Committee:
Paul Luck, Calco Chemical Division, American Cyanamid Co.
Dr. Herman E. Hager, General Dyestuff Corp.

Title of Paper:
"Tippy Dyeing of Wool and Its Control"

Judge:
Emmett Driscoll, Turner Halsey Co.

Speaker:
Henry E. Millson

Southeastern Section

Chairman of Contest Committee:
Matthew T. Barnhill, Avondale Mills

Contest Committee:
Robert O. Simmons, Pepperell Manufacturing Co.
Henry L. Dozier, Adelaide Mills
James C. Farrow, Jr., Russell Mfg. Co.
Norman P. Arnold, E. I. duPont de Nemours & Co., Inc.

Title of Paper:
"How the Mineral Content of Cotton Can Affect Beam Dyeing with Vat Colors"

Judge:
Curt Mueller, Bibb Manufacturing Co.

Speaker:
Dr. Howard M. Waddle, West Point Mfg. Co.

South Central Section

Chairman of Contest Committee:
C. E. Bachelder, Tennessee Eastman Corp.

Contest Committee:
Max Y. Parker, Holliston Mills of Tennessee, Inc.
Dr. F. D. Pilgrim

Title of Paper:
"Some Aspects of the Saponification of Acetate Rayon"

Judge:
J. D. Mosheim, Crystal Springs Bleachery

Speaker:
Dr. F. D. Pilgrim

Northern New England Section

Chairman of Contest Committee:
Sawyer Sylvester, Monsanto Chemical Co.

Contest Committee:
Hugh Christison, Arlington Mills
John Dalton, Pacific Mills
Wilfred Seneschal, Mass. Mohair Plush Co.
Frank Rizzo, Arlington Mills

Title of Paper:
"A Study in Detergency"

Judge:
Henry D. Grimes, American Woolen Co.

Mid-West Section

Judge:
Joseph H. Jones, Phoenix Dye Works

"Chief Justice"
Dr. Louis A. Olney

Meeting, N.N.E. Section

THE N.N.E. Section, A.A.T.C.C., held their fall meeting October 17, 1946 at the Andover Country Club, Andover, Mass. A special election of officers was first on the agenda; this was necessary to conform with the National A.A.T.C.C. policy. Officers will take office January 1947. The next meeting of the N.N.E. Section will be sometime in January 1947. The officers elected are as follows:

Chairman, Geo. Linberg
Vice Chairman, Frank J. O. O'Neil
Treasurer, Martin H. Gurley, Jr.
Secretary, Azel W. Mack

Councilors to represent the section were elected as follows:

Edward S. Chapin
Walter J. Hamburger, Jr.
Delbert E. Ray

The sectional committee for N.N.E. Section were elected as follows:

Edwin A. Buthmann
Ralph E. Hale
Wendell C. Lever
Albert E. Sampson

Herbert E. Wieland was appointed as Chairman of the Publicity Committee.

The speaker at the meeting was Ernest Cannity, Chief Engineer of James Hunter Machine Co., who spoke on "Modern Advances of Textile Wet Finishing Equipment." The meeting was attended by 150 members and guests. After a lengthy questioning period the meeting was adjourned at 10:30 p.m.

Respectfully submitted,
HERBERT E. WIELAND,
Chairman, Publicity Committee.

REGISTRATION FOR CONVENTION

Reproduced herewith is a registration card and face of an envelope which will be sent to each member of the AATCC when he receives the official notice of the Silver Jubilee Convention to be held in Boston at the Hotel Statler on December 12th-14th.

When you receive your notice you should make sure that the information requested on both the card and the envelope is given in full. If this is done, the registration will be completed before the Convention and a member will simply have to call at the desk for the envelope which will contain his identification badge and tickets for all the events to which he has subscribed.

Whenever a member plans to share a room with somebody else, he should give the name of the other occupant of the room on the reverse side of the envelope.

FOLLOW DIRECTIONS CAREFULLY
BE SURE TO INDICATE WHETHER MEMBER OR GUEST

INDICATE NATIONAL OR SECTIONAL OFFICE HELD_____

PRINT: LAST NAME, FIRST NAME, MIDDLE INITIAL SECTION

COMPANY ADDRESS

MEMBER ☐ GUEST ☐

DIRECTIONS: FILL IN BELOW AND MAIL AT ONCE IN ENCLOSED RETURN ENVELOPE TO A.A.T.C.C. HOUSING BUREAU, CARE OF CONVENTION BUREAU, CHAMBER OF COMMERCE, 80 FEDERAL STREET, BOSTON 10, MASS. CALL FOR YOUR TICKETS AND BADGE AT CONVENTION REGISTRATION DESK, MEZZANINE FLOOR, HOTEL STATLER.

FILL IN ENCLOSED REGISTRATION CARD AND RETURN WITH THIS ENVELOPE.

PLEASE RESERVE THE FOLLOWING TICKETS
ALL MEALS AT THE STATLER HOTEL, BOSTON
(PRICES INCLUDE TIPS AND TAXES)

		MARK HERE
REGISTRATION FEE MEMBER OR LADY GUEST	$3.00	
MALE GUEST	4.00	
CHARTER MEMBERS AND CORPORATE MEMBERS (LIMITED TO 650) DINNER, DEC. 12	6.00	
ALUMNI LUNCHEON* (LIMITED TO 250) DEC. 14	3.00	
SILVER JUBILEE BANQUET (LIMITED TO 1250) DEC. 14	6.00	
I ENCLOSE CHECK / MONEY ORDER FOR (TOTAL)		

MAKE CHECKS PAYABLE TO A.A.T.C.C. SILVER JUBILEE CONVENTION

DO YOU PLAN TO ATTEND LUNCHEON FOR NATIONAL OFFICERS SECTIONAL OFFICERS AND GUEST SPEAKERS, DECEMBER 13? (NO CHARGE)_____

DO YOU PLAN TO MAKE THE INSPECTION TRIP TO M.I.T. RESEARCH LABORATORIES, DECEMBER 14, AFTERNOON? (NO CHARGE)_____

I PLAN TO HAVE_____LADY GUESTS ATTENDING THE CONVENTION

*AT THE ALUMNI LUNCHEON I WOULD LIKE TO SIT AT _____ SCHOOL TABLE

A.A.T.C.C. SILVER JUBILEE CONVENTION
BOSTON, MASS., DEC. 12 - 14, 1946

NAME SECTION

COMPANY POSITION

HOME ADDRESS

HOTEL ROOM NO.

MEMBER ☐ GUEST ☐

If your hotel and room number have been assigned, indicate above. If not, give this information to Convention Registration Clerk when you pick up your registration envelope.

Toxicity of Germicides*

LOUIS C. BARAIL, M.D.
U. S. Testing Co., Inc.

IN a previous paper** we have described the performance tests we conduct on fabrics that have been treated with germicides. The fabrics are tested for sterility according to the U. S. Pharmacopoeia Sterility Tests, for bacteriostasis against several organisms, and for bactericidal value after contamination with *E. coli*. They are further investigated for their fungistatic and fungicidal values, sometimes against common non-pathogenic fungi such as *Aspergillus niger*, but more often against pathogenic fungi of the trichophyton group. These performance tests are always conducted after the antiseptic used for the treatment of fabrics has passed the informative tests. The purpose of these informative tests is to determine the harmlessness of a chemical compound. They consist in toxicity tests, skin irritant tests, sensitization tests and to these safety tests we sometimes add the old phenol coefficient test conducted against *Eberthella typhosa* and *Staphylococcus aureus*.

We have investigated over 350 compounds for their germicidal and fungicidal value when used for the treatment of fabrics. All were tested for toxicity, skin irritation and skin sensitization prior to the conducting of the performance tests. We have found that very few non-toxic compounds were of any value in the treatment of textiles. On the other hand, those which gave good performances were so highly toxic that they could not be used at the effective concentrations. Some others passed toxicity tests, but were skin irritants or skin sensitizers and for this reason, had to be discarded.

1. Toxicity Tests

The complete toxicity tests consist in determining the minimum lethal dose. However, in order not to spend too much time with highly toxic compounds, we always conduct a preliminary toxicity test which enables us to obtain sufficient information by the injection of only one concentration of the product. The dilution selected is the one that is submitted to us by the manufacturer as being the normal concentration of use. The compound is then extracted in the autoclave or merely dissolved in sterile physiological saline. After cooling, it is injected intraperitoneally in one cc. amounts in mice weighing between eighteen and twenty-four grams. The animals are observed during a period of three days. Any product that causes death within three days by injection of one cc. of the normal concentration of use is eliminated for further tests unless its manufacturer gives the proof that a lower concentration will give satisfactory results in the performance tests. (See Table I) This decision of discarding such compounds is based upon a safety measure and a fact verified by experience. The safety measure is to eliminate the risk of death of infants who would suck their underwear or garments treated with such compounds. The fact verified by experience is that the minimum lethal dose of compounds causing death with one cc. amounts of the normal concentration of use is always too low to be considered as safe for the treatment of fabrics. It is for this reason that we subject to the rather long procedure of the minimum lethal dose, only the compounds that have not caused the death of animals when injected in one cc. amounts of the normal concentration of use.

2. Minimum Lethal Dose Tests

As stated before, all compounds that pass the preliminary toxicity tests are tested for the determination of the minimum lethal dose. This method is too well known to warrant a full description. Let say briefly that it consists in injecting gradually increasing or decreasing doses of a product until the minimum dose is found which will cause death of all animals when injected intraperitoneally. The results are generally expressed in grams or milligrams per kilogram of body weight, or by the minimum dose that would kill a man weighing 150 pounds. (See Table II) The determination of the minimum lethal dose of these 350 compounds has shown two principal facts:

1. That there is absolutely no relation between the toxicity of a product and its germicidal and fungicidal value. There are compounds that are very highly germicidal and fungicidal and have a very high toxicity to man, but there are others which perform as well if not better and are practically not toxic at all. Consequently, the use of germicides and fungicides for the treatment of fabrics has a vast opportunity to select the best compounds with the maximum of safety.

2. Although some manufacturers are very careful in their claims for toxicity and performance, many others make claims that are so exaggerated that they look more like fairy tales than a fair business proposition. We won't discuss now the claims made on dilutions one to twenty-five, fifty or one-hundred-thousand, killing almost all bacteria and fungi. The fact is, that at concentrations ten times or even twenty times higher, no result was ever obtained. We are more interested in investigating such ridiculous claims concerning toxicity because they are a real danger to public health. Our minimum lethal dose tables also show that the prejudices of a few manufacturers against mercurial compounds, even the long chains of the phenylmercurial derivatives are absolutely unjustified because some of these compounds are much less toxic than others which do not contain mercury nor any other so called dangerous metal such as, copper, zinc, etc.

Intradermal Injection for the Presence of Skin Irritants

When testing chemicals for the presence of skin irritants and principally germicides and fungicides which are very often irritating, it is advisable to conduct tests on animals prior to any tests on human beings. Patch tests conducted on the shaved skin of rabbits used to be popular some years ago. The patches were applied either on the back or on the ear and left for lengths of time that varied with the laboratories, and sometimes also in the same laboratory with the compound tested. The results given by these patch tests on animals were not very accurate nor reliable because at the ex-

*A paper presented at the annual meeting of the New York Branch of the Society of American Bacteriologists, New York, December 27, 1945.

** A suggested method for thorough testing of antiseptic fabrics, presented at annual meeting, AATCC, Atlantic City, N. J., October 14, 1944, published in American Dyestuff Reporter, December 4, 1944.

TABLE I

Compound	Concentration of Use Injected	Result
Sodium Ethylmercuric Thiosalicylate	1/1000	Alive
4-nitro-anhydro-hydroxy-mercury-orthocresol	1/2500*	Died in 1 day
Dihydroxy-Dichlor-Diphenyl methane	1/100	Alive
Phenyl mercury acetate Compound #1	1/1000	
Triethanolamine Hydroxymercuriphenyl-ammonium Hydroxide solution	1/100	Alive
Anhydro-9-Hydroxymercuri-10-Isopropoxyoctadecanoic acid solution	1/100	Alive
Lactoxyphenylmercuric ammonium lactate solution	0.5/100**	Alive
Phenyl mercuric acetate Compound #2	1/3300	Alive
Phenyl mercuric borate	1/100,000	Died immediately
Di-isobutyl-phenoxy-ethoxyethyl-dimethyl-benzyl-ammonium chloride	1/100	Died in 1 day
Cetyl pyridinium chloride	1/1000	Died in 3 days
Alkyl-dimethyl-benzyl-ammonium chloride	0.1/100	Died immediately
Sodiumpentachlorphenate	0.2/100	Alive
Orthophenylphenol, Sodium Salt	1/100	Died immediately

*Concentration of use recommended by the manufacturer.
**5 to 7.5 times the concentration of use, which is normally 0.1% or less.

TABLE II

Compound	Minimum Lethal Dose (Grams per Kg. of body weight)
Sodium ethyl mercuric Thiosalicylate	0.0638
4-nitro-anhydro-hydroxy-mercury-orthocresol	0.0088
Dihydroxy-Dichlor-Diphenyl methane	0.64
Phenyl mercury acetate Compound #1.	0.42
Lactoxy phenylmercuric ammonium lacetate solution	0.2994
Phenyl mercury acetate Compound #2.	0.040
Phenyl mercuric borate	0.43
Di-isobutyl phenoxy ethoxy ethyl dimethyl benzyl ammonium chloride.	0.48
Cetyl pyridinium chloride	0.04
Sodiumpentachlorphenate	0.096
Triethanolamine hydroxymercuriphenyl-ammonium hydroxide solution	0.2564
Anhydro-9-hydroxymercuri-10-isopropoxy octadecanoic acid solution	0.9300
Alkyl-dimethyl-benzyl-ammonium chloride	0.022
Orthophenylphenol, Sodium Salt	0.48

piration of the test it was very often found that the animal had removed or displaced the patch. Consequently, the patch was not in contact with the skin during the full period of time where it was supposed to be, or it had been applied during the period of time to several locations instead of remaining all the time in contact with the skin at the same place. We have replaced the patch test on animals by an intradermal injection also conducted on rabbits and which is similar to the intradermal injections performed on human beings for allergy or sensitization tests. The rabbit is very closely shaved and the injection is given with a special short needle. The compound is injected with aseptic precautions at the concentration of use in one-half cc. amounts. The skin is then observed twenty-four hours later. The degree of irritation is measured by one plus, two plus, three plus and four plus. One plus indicates a very slight reaction consisting in redness of a small area of the skin. Two plus means marked irritation with redness and heat characterizing inflamation. The next step in the process of inflamation is defined by three plus. It is a very large irritation with blisters confined to the site of the injection. Four plus indicates very strong and spreading reaction with blisters opening and bleeding not only on the site of the injection, but around it in an area that is sometimes two or three times as big as the area of the injection. The intradermal animal injection test is very easy to perform, rapid and has a definite informative value when the tested compound causes a reaction, in other words, when the test is positive. We have never found any instance of a product giving a positive test on the animal injection that did not cause a similar irritation when applied on patch tests on human beings. For this reason, in our opinion this test should always precede any patch test on human beings. When the test is positive, the patch test can be eliminated thus saving time. When the intradermal animal injection test is negative, i.e. when there is no reaction the test is not conclusive. There are many cases of compounds which do not produce any irritation on rabbits and cause a slight irritation due to primary irritants or cutaneous sensitizers on human beings. For this reason, patch tests should always be conducted when the intradermal animal injection is negative. However, the value of this test in the case of positive results makes it absolutely indispensible in the testing of germicides and fungicides for primary irritants. We have reproduced in the following table the results of animal injection tests conducted as above described with germicides in concentrations which according to their manufacturers were supposed to be safe for the skin. (See Table III.)

Prophetic Patch Tests

Chemicals which have shown no irritation when tested on rabbits by intradermal injection will subsequently be tested on human beings by means of patch tests. The method we use is the procedure described by Drs. Louis Schwartz, Medical Director, and Samuel M. Peck, Senior Surgeon (R) of the U. S. Public Health Service, Industrial Hygiene Division, Dermatoses Section. The patch is prepared as follows: Small pieces one cm. square of four-ply gauze are dipped into a solution at normal concentration of use of the compound to be tested. After removal of excess liquid, the patch is applied to the skin and covered with a waterproof substance such as cellophane, non-allergenic rubber or wax paper, etc. The purpose of this covering is to retain the moisture of the gauze. The patch is then covered with elastic surgical tape which protects the entire patch and keeps it securely in place. The patch is generally applied on the upper part of the arm, but can be as well placed on the back, on the thigh, on the shin, or on the forearm. It is left in place for five days after which it is removed and the skin is observed for the presence of skin irritation. The following two days the skin is also examined as sometimes the signs of irritation appear only one or two days after removal of the patch. When an irritation is noticed, it indicates either that the compound contains primary skin irritants or that the individual is allergic to the compound. The prophetic patch test is conducted always on a minimum of two hundred people of both sexes and if possible of all ages. The skin irritation is attributed to allergy only when the number of individuals showing such reaction is very small. When a greater number of persons show a reaction, it means that the tested compound contains primary skin irritants and

TABLE III

INTRADERMAL ANIMAL INJECTION TEST

Compound	Concentration	Result
Sodium ethyl mercuric thiosalicylate	1/1000	++
4-nitro-anhydro-hydroxy-mercury-orthocresol	1/2500	++
Dihydroxy-Dichlor-Diphenyl methane	1/100	—
Phenyl mercury acetate Compound # 1	1/100	+
Triethanolamine Hydroxymercuricphenylammonium Hydroxide solution	1/100	—
Anhydro-9-Hydroxymercuri-10-Isopropoxy octadecanoic acid solution	1/100	—
Lactoxy phenylmercuric ammonium lactate solution	0.5/100	—
Phenyl mercury acetate Compound # 2	1/3300	—
Phenyl mercuric borate	1/100.000	+
Di-isobutyl phenoxy ethoxy ethyl dimethyl-benzyl-ammonium chloride	1/100	+
Cetyl pyridinium chloride	1/1000	+
Alkyl-dimethyl-benzyl-ammonium chloride	1/1000	—
Sodium pentachlorphenate Sample A	0.2/100	+
Sodium pentachlorphenate Sample B	0.2/100	+

consequently, it is not further tested for the presence of cutaneous sensitizers. We are of the opinion that a maximum of 2 per cent of irritation can be accepted, provided the irritation is of the very slight type. We have tested very powerful germicides and fungicides which did not cause any reaction neither due to primary irritants nor to cutaneous sensitizers, when tested at concentrations ten times stronger than the normal concentrations of use.

When a compound does not cause any irritation in the first part of the patch test, it has to be further tested to determine whether, while not being a primary irritant, it is not a cutaneous sensitizer. It is well known that the skin may not react to the first contact with a chemical, but react strongly the second time it comes in contact with the same chemical. This means that the skin has been sensitized by the first contact. In order to determine whether the tested compound caused sensitization, a patch exactly similar to the one applied for the first test is placed under the same conditions as the first one, ten days after its removal. It is left for forty-eight hours. At the expiration of this period, it is removed and the skin observed again for signs of irritation that day and the following two days. When there is a reaction, it can be said that the tested compound is a cutaneous sensitizer. In this case, a tolerance of from 1 per cent to 2 per cent is recommended because such irritation may also be of an allergic nature.

On the other hand, when the number of individuals showing a reaction is greater than 2 per cent, the use of such a compound can not be considered as safe when used against the skin. Among the compounds we have tested, we have given a particular attention to mercurials for various reasons. First, their efficiency was so far above that of all other compounds that their toxicity and irritating properties were very seriously checked and retested at various concentrations. Second, a few manufacturers of these compounds had made claims, regarding their harmlessness, that had to be very seriously verified. Third, there was a prejudice against mercurials by a few textile manufacturers who did not know enough chemistry to understand the difference between mercury content of a long chain phenyl-mercury derivative and a simple mercury salt like mercury chloride. The results of patch tests conducted according to the recommendations of Drs. Louis Schwartz and Samuel M. Peck have enabled us to definitely prove that there are long chain phenyl-mercury derivatives which are not primary irritants nor cutaneous sensitizers. The best example of this fact is given by lactoxy phenylmercuric ammonium lactate which was tested at concentrations as high as 1 per cent and did not show a single reaction or irritation neither in the first part nor in the second part of the test when its industrial uses generally call for a concentration of from 0.1 per cent to 0.005 per cent. (See Table IV.)

TABLE IV
PATCH TESTS

Compound	*Concentration*	*Primary Irritants*	*Cutaneous Sensitizers*
Dihydroxy-Dichlor-Diphenyl methane	1/100	These compounds have not been tested for primary irritation and cutaneous sensitization because their insolubility in water makes their application to light fabrics a complicated and costly operation.	
Triethanolamine-Hydroxymercuriphenyl-ammonium hydroxide solution	1/100		
Anhydro-9-Hydroxymercuri-10-Isopropoxy-octadecanoic acid solution	1/100		
Lactoxyphenylmercuric ammonium lactate solution	1/100	—	—
Phenyl mercuric acetate Compound #2....	1/3300	—	+
Alkyl-dimethyl-benzyl-ammonium chloride..	1/1000	++	

Besides the fact that the prophetic patch test is relatively easy to conduct it has greatly helped during the war in selecting the safest compounds and eliminating those that were too dangerous because of their irritating or sensitizing properties. This method is also credited with an indubitable victory against prejudices concerning certain mercury compounds, which have definitely shown under standard testing conditions to be absolutely harmless while performance tests proved them to be of an indisputable efficiency. However, all germicides and fungicides are not as harmless as these good mercurial compounds and it is absolutely necessary to be very careful when testing chemicals on human beings. We have observed cases where very definite reactions were observed only a few hours after application of the patch on compounds that were believed to be of the non-irritating nature as it was also confirmed by the intradermal animal injection test. For this reason, it is wise to observe the patch twenty-four hours after application when it is feared that the compound might be injurious to the skin. Some individuals are also allergic to certain chemicals and will show sometimes very strong signs of irritation when almost all of the people tested do not show the slightest reaction.

Conclusions

The results of the information tests conducted on all 250 compounds can be summarized as follows: Only fifteen were found suitable for the treatment of fabrics and thus submitted to toxicity tests. Out of these fifteen only seven were found to be non-toxic.

The determination of the minimum lethal dose showed that only one compound had a very high minimum lethal dose corresponding to over 40 lbs. for a man weighing 150 pounds. Most of the fifteen compounds, thirteen of them, had a minimum lethal does that was high enough to make them safe under normal conditions of use.

On the other hand, the two lowest minimum lethal doses have been found to be that of: 1) Algyl-dimethyl-benzyl-ammonium chloride. This compound, which was also found to be non-irritating to animals, but caused a definite irritation on human skin during the patch tests; 2) 4-Nitro-anhydro-hydroxy-mercury-orthocresol, which is highly toxic at the recommended concentration of 1/2500.

The intradermal animal injection test showed that only six compounds did not cause any irritation. Out of these six compounds, three could not be used on light fabrics because their insolubility in water makes their application difficult and costly. Out of the three remaining compounds, one which did not show any reaction on animals showed a definite reaction on human skin, one is not a primary irritant, but is a cutaneous sensitizer and only one out of 250 compounds has been found to be non-irritating and non-sensitizing.

Two important conclusions can be drawn from these series of tests. First, it is obvious that a great number of manufacturers do make fantastic claims not only about the efficiency of their products, but also about their low toxicity and non-irritating properties. This is absolutely unfair and dangerous. Some of the compounds tested are so toxic or so irritating that their use according to the recommendations of their own manufacturers can cause very severe dermatites, or even death of infants and babies. This is a warning to textile manufacturers just as well as hospitals and physicians that they should not blindly follow the instructions of manufacturers of germicides, but first investigate personally about the safety of any new, untested chemical highly advertised as being non-toxic, non-irritating, non-sensitizing, etc.

The second conclusion is about the patch test method described by Drs. Schwartz and Peck which is of a very great value for the elimination of skin irritants and cutaneous sensitizers. In our particular case, it has helped us in demonstrating two things: (1) that many germi-

cides believed to be, or advertised to be, non-irritating and non-sensitizing are actually harmful to human skin and shall be discarded for the treatment of fabrics to be worn next to the skin.

(2) On the other hand, it demonstrates that prejudices against all mercurials are not founded, as long chain phenyl-mercury derivatives or at least one of them does not cause skin irritations due to the presence of primary skin irritants or cutaneous sensitizers. The patch test method of Drs. Louis Schwartz and Peck has rendered an immense service to the textile and allied professions by indicating that such compound is absolutely harmless to human skin and can be used for the treatment of fabrics to be worn next to the skin.

TRADE NOTES • NEW PRODUCTS

• New England Textile Foundation Program

George T. Metcalf, Executive Secretary of New England Textile Foundation at 68 South Main St., Providence 3, R. I. announces that Bradford Durfee Technical Institute of Fall River, Mass. and New Bedford Textile Institute of New Bedford, Mass. have recently accepted an invitation to participate in the activities of the Foundation. Lowell Textile Institute of Lowell, Mass. and the Textile School of Rhode Island School of Design, Providence, R. I. have been participating for more than a year, so that now all the textile schools in New England are associated with the Foundation.

These schools will benefit as follows:—

1. They may request the Foundation to make grants for more adequate compensation of their faculties.
2. They may request grants for the purchase of new modern textile equipment for student instruction.
3. Each year each school will be eligible to accept 10 or more winners of $500.00 freshman scholarships which will be awarded by the Foundation after competitive examinations given by the College Entrance Examination Board throughout the country. Additional scholarships will be available to these students in succeeding years if they merit them.

The New England Textile Foundation is a trust which was created on December 5, 1944, with Providence National Bank as trustee. It is administered by an Executive Committee, which is elected by an Industry Committee, with the exception of one member who is appointed by Providence National Bank. The Executive Committee consists of five members:—Harold W. Leitch of Pacific Mills, Royal Little of Textron Incorporated, Gordon Osborn of Warwick Mills, Samuel Pinanski of M & P Theatres Corporation and Rupert C. Thompson of Providence National Bank. The Industry Committee now includes more than 50 members, all of them prominent in the textile or related industries.

The Foundation acts as a recipient of gifts from members and friends of the textile industry to be used, at the discretion of the Foundation, by the textile schools of New England for the training of future executives and technicians for textile mills in New England.

In order to create widespread interest and support for its objectives, the Foundation is launching a fund raising campaign in November of this year. Further details regarding this campaign will be announced later.

Students interested in scholarships should write immediately to the Foundation for detailed information including the necessary application forms.

• The Definized Process

The Definized Process for dimensional stabilization of textile fabrics is a process which is said to make it possible to obtain complete shrinkage control on all types of rayon, as well as acetate, wool, aralac, and mixed fabrics without leaving any foreign material on the fiber.

The Definized Process depends on neither chemical modification nor resin deposition. The chemical composition of the fibers is unchanged, and all their original physical properties are said to be retained. The Definized Process employs a chemical swelling agent which under proper control relaxes the tensions and stresses within the fiber by means of a molecular or micellar re-orientation process. The swelling agent is removed rapidly under conditions which prevent physical or chemical damage to the fibers. This is said to stabilize the fabric dimensions without deterioration in strength or hand.

It is stated that, by proper control during the subsequent dyeing and finishing processes, a fabric stable to repeated laundering is obtained. It is claimed that if fast dyes are used, the fabric can be guaranteed unconditionally washable by hand, by machine, or by commercial laundry. In a recent series of tests, Definized rayon shirtings laundered 25 times at the boil held their dimensions within 0.3 per cent. The extreme importance of dimensional control within 1 per cent may be appreciated if one considers that despite the fact that some types of garments are rendered ill-fitting by a 2 per cent shrinkage, many rayon fabrics on the market will shrink as much as 20 per cent in a single laundering.

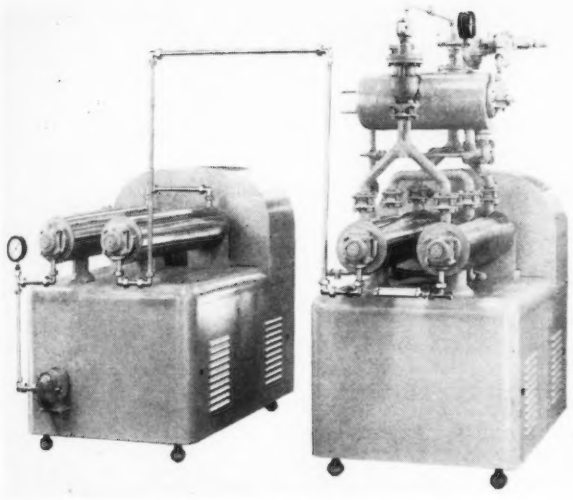
The Definized Process does not cause chlorine-retention, and, when sizing and softening materials are selected with care, a fabric completely free from chlorine retention is said to be obtained.

The Definized Process is the subject of several patent applications. Finishers are being licensed to use the process on a royalty basis, and extensive promotional advertising is being undertaken by the Alrose Chemical Co. who have developed the process and Aqua Sec Corp., selling agents for the process. Goods are already reaching the market with Definized labels and tags in ever-increasing volume.

• Preparation of Starch Water Slurry

Continuous, closed Votator equipment is now being usd with marked success in the preparation of starch water slurry for printing gum, it is announced by the Votator Division of The Girdler Corporation, Louisville, Ky. The material is pumped into one end, instantaneously and uniformly heated or cooled, and discharged at the other end at the temperature desired. It is stated that contamination and the entry of foreign matter are prevented, extremely close temperature control is maintained, and the physical properties of the paste are greatly improved. Heat and cooling mediums are economized and production is virtually automatic.

The advantages gained with this processing technique are illustrated in one of the nation's largest textile printing plants. Since converting from the kettle method to Votator equipment, labor requirements for the operation are said to have been lowered 60 per cent, and the paste is produced with 10 per cent less starch. It is claimed that the starch is reduced to finer granules and is of unvarying consistency and high quality. Dyestuffs are spread more evenly and adhere better, and there are no hard lumps to cause printing imperfections.



Starch paste for textile printing is being produced with Votator equipment. The 4-cylinder 4" unit shown here has a capacity of 177 gallons per hour.

Each Votator printing gum unit in the installation referred to here consist of two 2-cylinder Votators. In the steam jacketed No. 1 cylinder of the No. 1 unit, starch water slurry is received at an average room temperature of 60° F., cooked and discharged at 200° F. into the water-jacketed No. 2 cylinder of the No. 1 unit, where it is cooled from 200° F. to 140° F. It then enters the No. 1 and No. 2 cylinders of unit No. 2, where it is cooled from 140° F. to 50° F. and discharged ready for use. The heating medium in cylinder No. 1 of unit No. 1 is steam at 150 p.s.i. and temperature of 360° F. The cooling medium in the No. 1 and No. 2 cylinders of unit No. 2 is Freon at 20° F. Capacity of the 4-cylinder 6" Votator is 235 gallons per hour. Capacity of the 4-cylinder 4" Votator is 177 gallons per hour.

When not in use, a Votator unit's cylinders can be completely cleaned in 10 minutes by simply introducing room temperature water instead of slurry for that period.

A typical Votator installation occupies only half the space required by the kettle method.

It is claimed that Votator equipment has revolutionized processing procedures in many industries. It is used in the production of 80 per cent of all U. S. margarine; lard, photo emulsions, shortening, printing ink, polishes, paraffin wax, lubricating grease, and has many other applications.

• P & G General Manager

Directors of The Procter & Gamble Company at the annual organization meeting held on October 9, 1946 in Cincinnati elected Neil H. McElroy to fill the newly created position of Vice-President and General Manager. Mr. McElroy has held the position of Vice-President and since last March has served as assistant to the President. He became Manager of the Promotion Department in 1929 and was named Manager of Advertising and Promotion in 1940. In 1943 he was elected to the Board of Directors and named Vice-President in charge of advertising and promotion.

• Officers, American Potash

Bernard R. Armour, president of the Heyden Chemical Corporation, has been elected chairman of the board of directors of the American Potash and Chemical Corporation, it has been announced by Frederick Vieweg, president of the company.

The Heyden Corporation owns a substantial amount of outstanding American Potash stock. The new chairman succeeds W. J. Froelich, who resigned.

Dr. Donald B. Keyes, a vice-president of the Heyden Company, and William S. Glazier, a partner of Lehman Brothers, were elected to the board. Dr. Keyes and Robert Brown, a partner of Kuhn, Loeb & Co., were named to serve on the board's executive committee.

Resignations of three other members of the board, Philip W. Collins, S. James Crowley and John P. Wagner, also were announced.

• Samuel M. Carver Retires

Samuel M. Carver recently retired as the Purchasing Agent for the Hampton Print Works Division of the Aspinook Corporation. To commemorate the occasion a testimonial dinner was given for him in the Yankee Room of the Hotel Northampton on Saturday evening, October 19, 1946. Among the invited guests were:

George O. Linberg, E. I. duPont de Nemours & Co., Inc., Boston
Gene Walker, Atlas Plywood Corp., Southbridge
A. H. Pierce, General Dyestuff Corp., Boston
Warren Dewing, General Dyestuff Corp., Boston
Thomas Roberts, Arnold, Hoffman & Co., Providence
Edwin Arnold, Arnold, Hoffman & Co., Providence
A. L. Phelps, Contractor & Engineering, Springfield
John Shea, Becco Sales Corp., Boston
John Leggett, Westinghouse Electric Co., Springfield
Alex Blair, Westinghouse Electric Co., Springfield
Clifton Johnson, Johnson Asbestos Co., Springfield
W. A. Cummings, E. F. Drew & Co., Boston
Mr. Martin, Holyoke Valve & Hydrant Co., Holyoke
Miles Stray, J. Russell & Co., Holyoke
H. E. Chaffee, J. Russell & Co., Holyoke

Mr. Carver has had an interesting career. He graduated from Harvard University in 1906, having majored in chemistry and languages. His first job was with the West Virginia Company at Mechanicsville, N. Y., a large pulp and paper concern. He held practically every departmental job in the sulfite mill and eventually became shift foreman.

Samuel M. Carver

About this time, the Hampton Company was buying all of its caustic and were doing no recovery work. Thomas McConnell, President of the Hampton Company, offered Mr. Carver a job in that line. He instituted several safety measures in the different departments, that also saved time and money for the company. Six months after he had started

working in 1909, they started using caustic tanks and making their own product. A crude, small laboratory was also started.

Among Mr. Carver's other duties was some purchasing and when the first World War started the Hampton Company found itself cut off from their source of supply of many hard to get chemicals because they had no contracts. Mr. Carver was responsible for the first ones they had on these items, and in so doing, became interested in the patents on "artificial silk" which was then being experimented with, chiefly in Germany. After many disappointing experiments in his small laboratory, he finally was able, with very little equipment, to produce a single filament strand of rayon.

In 1925 he was sent to Germany with Archie McConnell to purchase machinery for the development of rayon thread at the Hampton Company. He returned in April of that year having had success in the venture upon which he was sent. It was not until the next year, however, that they were able to begin production.

When the German machinists arrived with the machines, Mr. Carver had to act as interpreter as they could not speak English. At that time the whole business transaction was surrounded with an air of secrecy as the company did not want it known that they were to produce rayon yarns. However, when the machines arrived, it was pretty well known through the trade and great interest was shown.

Among Mr. Carver's other jobs with the company was that of temporary master mechanic. One could say he was successful in every job he was given. When the purchasing department was instituted he became purchasing agent and held this position until his retirement.

• Toronto Office, Carbide and Carbon

Carbide and Carbon Chemicals, Limited, Toronto, is now handling the marketing in the Dominion of Canada of the synthetic organic chemicals produced by Carbide and Carbon Chemicals Corporation. Both companies are Units of Union Carbide and Carbon Corporation of New York. A new sales office was opened at 159 Bay Street, Toronto, on September 25, and George D. Garrett, Jr., has been appointed Sales Manager of the Chemicals Division of Carbide and Carbon Chemicals, Limited. Warehouse stocks are maintained in Toronto and Montreal, and, as business developments demand, warehouse service will be established in other industrial areas throughout Canada.

All of the industrially important alcohols, aldehydes, anhydrides, esters, glycols,

George D. Garrett, Jr.

glycol-ethers, ketones, chlorinated solvents and nitrogen compounds are included in the list of more than 200 products to be handled by the Canadian firm. These chemicals are raw materials for the manufacture of pharmaceuticals, synthetic resins, plasticizers, emulsion products, hydraulic fluids, textiles, ore flotation agents, and in many other products of Canadian industries.

• American Viscose Officers

At a meeting of the board of directors of American Viscose Corporation held October 2, the resignation of William C. Appleton as president and director was accepted. Dr. Frank H. Reichel, chairman of the board, was elected to succeed Mr. Appleton and will fill both positions.

Mr. Appleton will be retained as consultant to the corporation, but will otherwise be free to undertake such other activity as he may decide to engage in.

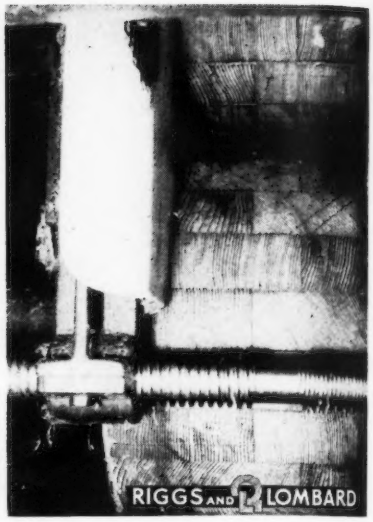
George S. Hills and Harry L. Dalton were elected directors. William B. Olmsted and George M. Allen were elected vice-presidents.

• Resin Treated Lags

Riggs & Lombard, Inc., Lowell, Massachusetts, state that they have recently experienced splendid results after testing their new Resin Lags for more than 14 months on a No. 65 Fulling Mill at the Somersville Manufacturing Company, Somersville, Connecticut.

Recently developed by Riggs & Lombard, the Resin Lag, as the name implies, is a wooden lag treated with resin. This process is said to make possible the use of softer, cheaper, more plentiful woods which have a better grip than hard woods, a much better grip than rubber, and are impervious to soap, alkali and tar removers.

The lags illustrated in the accompanying photograph have been in continuous two and three shift operation for 14



Resin Treated Lags on a No. 65 Fulling Mill

months at Somersville. A good portion of this work was on heavy O.D. goods for the Army. The rolls show practically no wear at all, and curvature or bowing out is practically negligible. This demonstration justifies Riggs & Lombard's prediction that Resin Lags will last 4 or 5 years before renewal or repair is necessary.

It is pointed out that this new product saves not only on direct roll cost because of its long life, but that it also greatly reduces the number of times which rolls have to be removed and replaced. The expense incidental to these latter operations is much more than the turning down cost in a repair operation.

• Resign from Apex Chemical

Dr. Seymour M. Hermann, president and director of the Apex Chemical Company, Inc., since its inception, announces that as of July 1, 1946, he has terminated his connections with the company. From 1900 until 1930 he was their sole research chemist, and as the staff grew under his aegis and later that of his son, Stanford L. Hermann, the senior Hermann remained as chief research chemist.

Dr. Hermann, a Fellow of the American Institute of Chemists, the American Leather Chemists Association, a member of the American Chemical Society, the American Military Engineers, and an Arbiter for the American Association for the Advancement of Science, is offering his services as a consultant in the textile, leather, paper, and allied chemical specialty fields. He can be reached at 23 West 73rd Street, New York 23, N. Y., or at the laboratories

of the American Organic Chemical Corp., 1300 Allen St., Linden, N. J., where he will maintain facilities for research and experimentation.

Stanford L. Hermann, vice-president and director, has also announced the termination of his association, as of July 1, 1946, with the company.

An employee of the Elizabeth plant since 1936, Mr. Hermann was successively a research chemist, plant purchasing agent, war-expediter and vice-president in charge of operations.

Henceforth, he will also be located at the plant of the American Organic Chemical Corporation.

• Returns from South America

C. W. Sampson, Chemical Sales Manager of Emery Industries, Inc., Cincinnati, Ohio has returned from a two months trip through South America. Mr. Sampson reports that business in general throughout South America is very active.

• Joins Plastics Guild

O. O. Brant, President of Plastics Guild Corporation announces that Dr. E. J. Jacob has recently joined their research staff to assist in their expansion program.

• Promotions at Lowell Textile

President Kenneth R. Fox of the Lowell Textile Institute recently announced that six members of the faculty had been promoted from instructors to assistant professors. The promotions have been approved by the Board of Trustees and the State Department of Education.

Dr. Paul C. Panagiotakos, member of the Lowell School Committee, and an instructor at the Institute since 1939 was advanced to assistant professor of Organic Chemistry. Dr. Panagiotakos received his bachelor's degree from M.I.T. and a Ph.D. in chemistry from the same school. He is the author of numerous papers on organic chemistry and has a wide industrial experience in research on petroleum and synthetic rubber. During the war he did special research work for the government in connection with the development of synthetic rubber.

Milton Hindle of Melrose, instructor in the Engineering Department since 1930, was promoted to assistant professor in the same department. Mr. Hindle is a graduate of the Lowell Textile Institute and had a wide experience in the textile industry before returning to the Institute as an instructor.

John L. Merrill of Lowell was advanced from instructor in weaving and warp preparation to assistant professor of the same subject. He is a graduate of the Lowell Textile Institute and his textile experience includes work with the Pacific Mills, Merrimack Woolen Mills, and Crompton Knowles Loom Works.

William G. Chace of Westford, instructor in inorganic chemistry and microbiology since 1926 was promoted to assistant professor of the same subject. Mr. Chace is a graduate of Brown University where he received his master of science degree. He is the author of several books on chemistry and numerous technical papers. During the war he served in the Navy as a radar technician with the rank of lieutenant.

Russell M. Fox of Lowell, instructor in cotton design, was advanced to assistant professor in the same department. He is a graduate of Lowell Textile with 25 years experience in designing, working with the Massachusetts Mills and Appleton Cotton Mills before coming to Textile.

Charles A. Everett of Chelmsford was promoted from instructor to assistant professor of textile dyeing. Mr. Everett is a graduate of Lowell Textile Institute and has had wide chemical experience with Atlantic Dyestuff Company, North Berwick Company and others.

• Houghton Conference

A national sales conference of managers and field representatives of E. F. Houghton & Co., industrial oils, leathers, and chemicals, was held in Philadelphia October 7-9.

More than 100 members of the sales organization traveled a total of nearly 100,000 miles from every section of the country to attend this conference, the first national meeting since before the war.

New products for peace-time industrial production were announced and graphically explained. These included new series of industrial rust preventives, metal cleaners, foundry core binders, wetting agents, detergents, textile finishes, synthetic packings, cutting oils and heavy-duty lubricants.

Product sessions were held at the Adelphia Hotel, Philadelphia, on October 7th and 8th, followed by a dinner tendered the visiting sales force by the company's Board of Direceors headed by Major A. E. Carpenter. Visitation of the company's Philadelphia plants was held on October 9th.

The committee handling the details of the meeting included G. W. Pressell, Executive Vice-President; D. J. Richards, Vice President—Sales; H. E. Sanson, Eastern General Sales Manager and D. C. Miner, Advertising Manager.

• Join Amco Chemical

C. Russel and James D. Havey, who, upon the latter's release from the United States Army, formed a textile chemical sales organization known as the Havey Brothers Company, with headquarters in Kingston, Pennsylvania, have now joined with the Amco Chemicals Corporation of Newark, New Jersey, and have purchased the assets and formulae of the former Berkeley Products Company.

Amco Chemical has been producing the textile chemicals handled by Havey Brothers, including the P.V.A. based nylon size, known as Para Knit N.

C. Russel has been elected the Executive Vice President of the new corporation, while James D. is charged with the responsibility of Vice President In Charge Of Sales. The Havey Brothers are the sons of the late J. Edward Havey, who was the General Manager of the Sauquoit Silk Mills.

The immediate plans of this new corporation, of which Frank Alberte is President, calls for an expanded program into the textile field, including throwing, knitting, weaving and dyeing.

The manufacturing plant and main offices of the Amco Chemical Corporation are located at 70 Lister Avenue, Newark 5, New Jersey.

• Hercules Booklet

A new four color, non-technical, illustrated booklet, "A Trip Through Hercules Land," which explains how Hercules Powder Company products are utilized in twelve major industries, is now available.

The twelve major industries covered are: Adhesives, Protective Coatings, Synthetic Fibers, Plastics, Soap and Disinfectants, Insecticides, Rubber, Ink, Construction, Textiles, Paper, and Mining.

In addition to the more complete story of the use of Hercules products in the twelve major industries this new book also includes a list of 41 industries and the Hercules products utilized in each of the industries.

The cover of the eight and one-half inch by eleven inch book is a colored map of "Hercules Land," artist Artzybasheff's conception of the extensive field for Hercules products. "Hercules Land" is divided into six segments. Each segment represents a Hercules operating department, Explosives, Cellulose Products, Chemical Cotton, Paper Makers Chemicals, Synthetics, and Naval Stores.

• Solvay Technical Bulletin

Solvay Sales Corporation has announced a new edition of Solvay Technical &

Engineering Service Bulletin No. 5, "Soda Ash." This new 64 page bulletin contains chapters on the properties of soda ash, bulk shipments, storage, conveying and elevating, unloading of bulk, unloading of bags and barrels, weighing, proportioning and feeding devices, sampling and analysis, precautions and conversion tables.

This bulletin should be of interest to both operators and technical men in industries using soda ash, and is offered by Solvay without charge upon request to any branch office of the Solvay Sales Corporation or to their Advertising & Sales Promotion Department at 40 Rector Street, New York 6, N. Y.

• Vinyl Butyral for Stain-Proof Fabrics

Monsanto Chemical Company has announced that its vinyl butyral plastic, long used as an interlayer material in safety glass, is ready for a broadscale entry into the textile coating field. Monsanto claims it will make possible such items as stain-proof tablecloths, furniture slipcovers immune to ink and draperies that can be wiped clean with a damp cloth.

In sharp contrast with familiar rubberized or oilcloth type coatings, it was said, the new application affords resistance to stains and water while allowing the fabric to retain its original identity.

In the mill application process, it was continued, there is bonded to the fabric a super-thin, almost-invisible coating of flexible and transparent vinyl butyral—so tightly adhering that it will not chip or peel under normal usage, and so inconspicuous that only an expert can visually distinguish a properly coated cloth from an untreated companion cloth.

Advantages of normal appearance and easy cleanability, it was stated, are accompanied by improved resistance to abrasion, longer wear, increased color fastness and a lessened tendency to stretch or shrink. The treated fabrics will stand up under repeated launderings, should this be deemed necessary, and can be pressed on the untreated side with a moderate iron.

• CLASSIFIED ADVERTISEMENTS •

The rate for "Position Wanted" advertisements in this column is 2 cents a word—with a minimum of 50 cents per insertion. For all other types of advertisements—i.e., help wanted, machinery or supplies for sale—the rate is $7.50 per column inch or less per insertion.

CONFIDENTIAL EMPLOYMENT SERVICE — For Dyers, Chemists, Colorists, Mill Managers, Superintendents and others seeking positions and for employers seeking high grade men. Charles P. Raymond Service, Inc., 294 Washington St., Boston, Mass. Over 45 years in business.

WE BUY YOUR EXCESS INVENTORY OF DYESTUFFS AND INTERMEDIATES. WRITE BOX 128.

WANTED: Colorist, in laboratory of plant manufacturing dyestuffs. Location Staten Island, N. Y. In letter of application please indicate age, experience in detail and education background. Write Box 133.

WANTED: All types dyestuffs, spot and future shipments, including Direct Blacks, Direct Greens, Congo Red, Sulphur Black, Sulphur Blue, Malachite Green, Brilliant Red 12B, Methyl Violet, etc. Write Box 134.

WANTED: TEXTILE CHEMISTS. Recent graduates of Textile School. Will be trained to call on Textile Mills to demonstrate Textile Processes. Company located in Eastern New York. State full particulars, experience, age and salary desired. Write Box 135.

WANTED: Young Textile Chemist with laboratory experience in matching colors on Cotton, Rayon and Woolen Yarns. For research development of new pressure dyeing machines. Some sales ability desired. Excellent opportunity with nationally known firm. State qualifications, background, age, salary desired. Write Box 136.

POSITION WANTED: Aggressive young man desires position as plant manager or technical assistant. Experienced in the application of all types of dyestuffs including pigments. Capable of handling development of new methods and processes. Will consider other offers. Write Box 139.

POSITION WANTED: Purchasing Agent familiar with textile paper, leather and paint industries, thoroughly familiar with dyestuffs and chemicals desires position where experience and ability are of value. Write Box 140.

WANTED: SALES REPRESENTATIVE; Nationally known manufacturer of chemical specialties for rayon processing offers unusual opportunity for qualified sales representative in Pennsylvania territory. Must understand throwing, sizing and weaving processes, all types synthetic knitting and weaving yarns, including nylon. Selling and practical mill experience preferred. Give complete information including age, education, training, experience, references. Write Box 141.

WANTED: Textile Chemist for research and control in diversified throwing plant. Experience preferred but not necessary. Excellent opportunity. New England. Write Box 142.

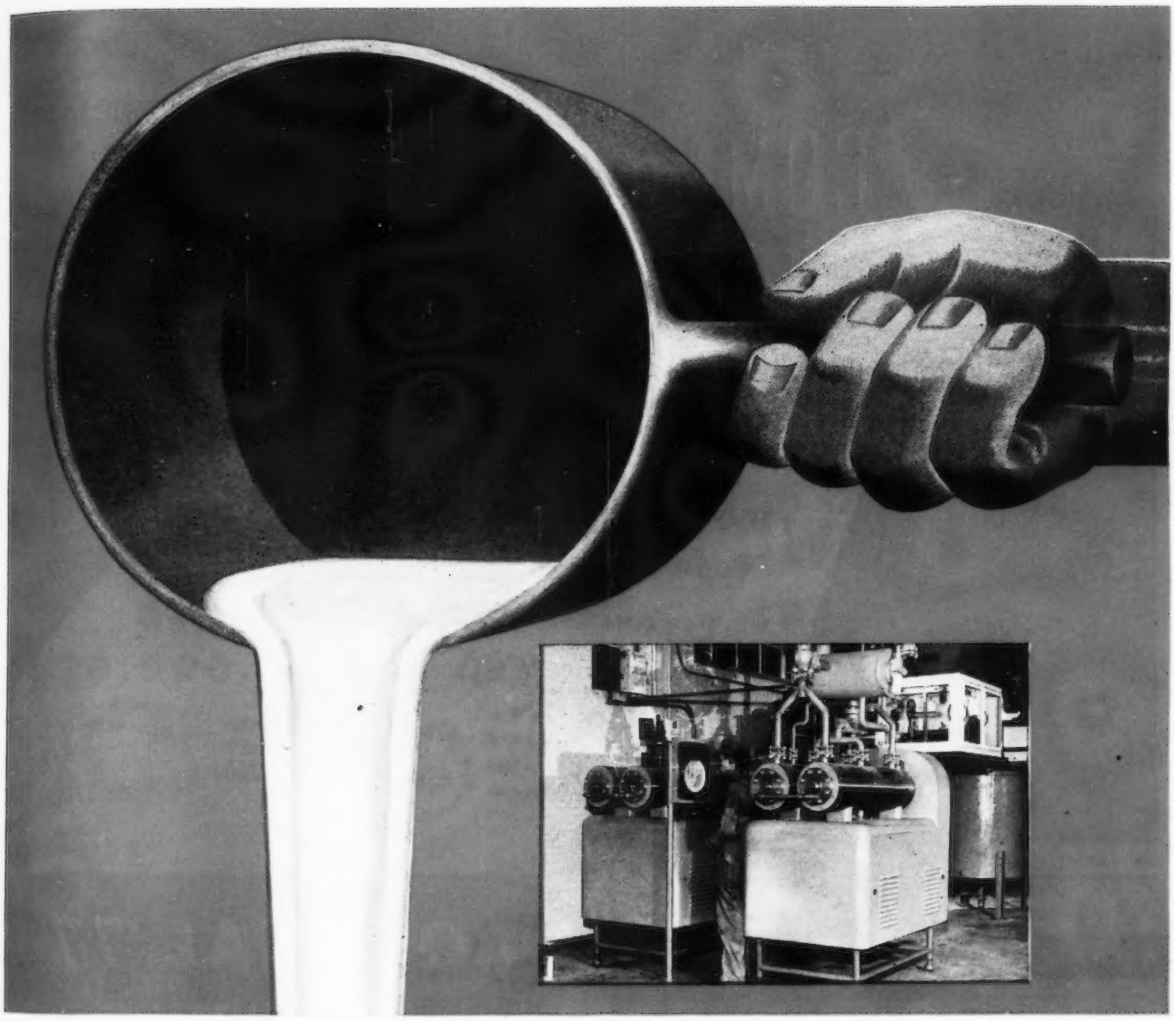
POSITION WANTED: Printing Colorist looks for position as Colorist or superintendent, 16 years experience in every phase of Screen Printing. Write Box 143.

POSITION WANTED: Technical man with 24 years experience including Sales and Administration. Desires position as dyestuff buyer for Mill, Plastic Firm or Salesman for Dyestuff Manufacturer. Write Box 144.

Use

Reporter Classifieds

For *Results!*



Better starch paste at far less cost

Continuous, closed Votator equipment expedites another processing job

THIS time it's in the textile industry, at Rock Hill Printing and Finishing Company, Rock Hill, South Carolina.

Each 24-hour day, the company processes thousands of gallons of starch paste, vehicle for dyestuffs used in textile printing. This formidable cooking and cooling job required five men per shift with open kettle methods. But since converting to continuous, closed VOTATOR equipment, only two men are required, and half the floor space. The paste is produced with 10% less starch. And because of positive control over temperatures and mixing, plus positive exclusion of grit, the paste is of uniform consistency.

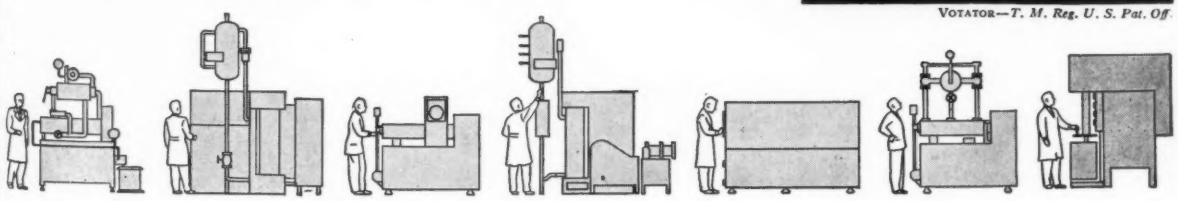
The various VOTATOR advantages add up to savings in processing cost which will amortize Rock Hill's VOTATOR installation in little more than a year.

Starch paste, lard, photo emulsions, margarine, shortening, printing ink, polishes, paraffin wax, lubricating grease . . . VOTATOR equipment is a cost saver for many products which are processed in a viscous state and require heat transfer. If you manufacture a product in this category write to The Girdler Corporation, Votator Division, Louisville 1, Kentucky.

District Offices:
150 Broadway, New York City 7
2612 Russ Building, San Francisco 4
617 Johnston Building, Charlotte 2 North Carolina

THE Votator
A GIRDLER PRODUCT

VOTATOR—*T. M. Reg. U. S. Pat. Off.*



COMMONWEALTH
COLOR & CHEMICAL CO.

More than thirty years' experience in the manufacture of Chemical Specialties, Dyestuffs and Dyewoods for the Textile and Allied Trades . . .

MAIN OFFICE AND WORKS:
NEVINS, BUTLER and BALTIC STREETS, BROOKLYN 17, N. Y.
PHILADELPHIA • CHICAGO • GLOVERSVILLE • MONTREAL

QUALITY RICHMOND PRODUCTS

Less Handling with

AFTER CHLOR
Eliminates 3 to 5 Handlings

Bleach with
Hypochlorite
Rinse and Use

AFTER CHLOR
THAT'S ALL!

Write for FREE Sample

RICHMOND OIL, SOAP & CHEMICAL CO., Inc.
1041-43 FRANKFORD AVE., PHILADELPHIA 25, PA.

AQUAKAL #77
A SYNTHETIC AMINE DETERGENT

•

REPLACES soap or portion of your Soap—for SCOURING piece goods, Cotton, Wool, Rayon, Acetate or Nylon.

•

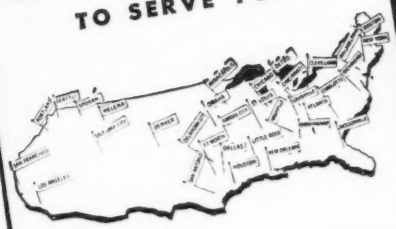
Brighter colors due to the
PENETRATING and LEVELING
qualities.

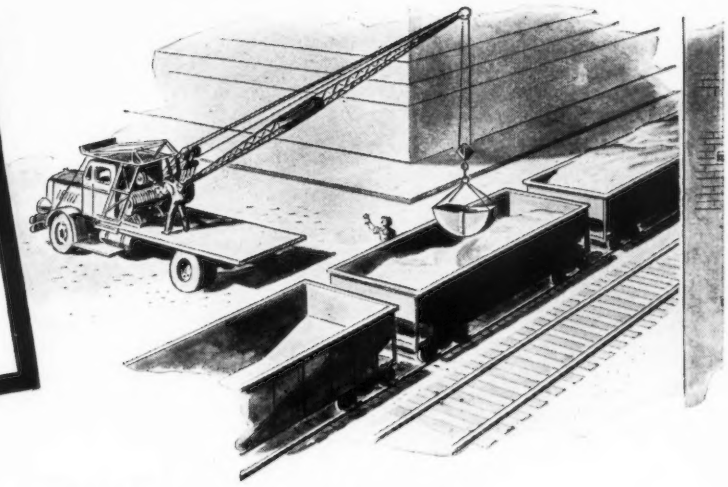
•

Excellent for Soaping Vats—
not affected by hard water.

Kali MANUFACTURING COMPANY
Manufacturing Chemists
427 MOYER ST. PHILADELPHIA 25, PA.

33 REGIONAL OFFICES TO SERVE YOU





AVAILABLE NOW

BY THE TRUCKLOAD OR TRAINLOAD
$70,000,000.00 OF INDUSTRIAL CHEMICALS

ONCE-IN-A-LIFETIME BUYS!

- Acids
- Gas cylinders (all types)
- Dyes
- Plastic materials
- Solvents
- Sealing compounds
- Calcium chloride
- Dimethylaniline
- Copper naphthenate
- Synthetic and natural glues
- Printing inks (black and colors)
- Zinc Carbonate
- Picric Acid
- Welding fluxes
- Detergents and cleaners
- Water treating compounds
- Coal Tar
- Borax and boric acid
- Metal salts, oxide and hydroxides
- Pitches
- Rubber processing chemicals
- Gases and most other chemicals

Ready for quick sale in large quantity, many *at prices well below market*, are hundreds of items in the government's huge war surplus stockpile of industrial chemicals. If you need industrial chemicals of any kind, *in any amount*, it will pay you to get in touch with your War Assets Administration Regional Office. (Listed below). Among these chemicals are some at present in short supply from usual sources. If your regional WAA office does not have them, the Inter-office Product Location Service has been set up to locate them *fast* if available anywhere in the U. S. *All* items are ready for quick sale, under credit terms if desired. Write now—or use the coupon below.

FREE FACTS

War Assets Administration (address nearest Regional Office)
Please supply without obligation, prices, available quantities and locations of items written in below:

. . . .

impartial survey shows...

"USERS OF MILDEW-PROOFING COMPOUNDS WANT DURABILITY"

G-4 PROVIDES PERMANENCE OF PROTECTION

An impartial survey, in which 212 textile mills participated, revealed that durability and permanence of protection are desirable and essential qualities for mildew-resistant finishes. Givaudan's G-4* has long been known for its exceptional stability and permanence over a broad range of temperatures, both during processing and in use. Its flexibility and water resistance coupled with its non-corrosive nature assure fabric life-freedom from mildew and rot. G-4 is economical, non-toxic, non-irritating, and it does not affect fabric processing.

Enlarged facilities for G-4 production now enable Givaudan to meet the expanded mildew-resistant requirements of the textile industry.

*Dihydroxy Dichloro Diphenyl Methane

"BUY WISELY . . . BUY GIVAUDAN"

Givaudan-Delawanna INC.

Industrial Products Division · 330 WEST 42nd STREET · NEW YORK 18, N. Y.

A COMPLETE LINE OF
DYESTUFFS
for all branches of
TEXTILE DYEING
AND PRINTING—
PAPER AND LEATHER

★

Specializing in fast colors

NOVA CHEMICAL CORPORATION
147-153 Waverly Place
New York 14, N. Y.
WAREHOUSES IN NEW YORK and CHARLOTTE, N. C.

LeaTex

The name that means
leadership in
CHEMICAL
SPECIALTIES
for the
TEXTILE INDUSTRY

"Always Reliable"

LEATEX CHEMICAL COMPANY
2722 N. HANCOCK ST., PHILADELPHIA, PA.

Time Tested

CaroGant Cotton warp sizing

DUOFOL-L An outstanding wetting-out and sanforizing agent.

ALKAMERCE The ideal mercerizing penetrant

HYMOLON Wetting out agent, emulsifying agent, detergent

HART PRODUCTS

QUALITY CHEMICALS FOR EVERY PHASE OF TEXTILE PROCESSING

TRUKON A good water-repellent for cottons, rayons, woolens

ARYLENE An exceptional carbonizing agent

CATYLON Cation-active softener

For a quarter of a century, outstanding textile mills have standardized their wet processing operations with HARTEX chemicals. HARTEX research, keeping pace with the latest development, has met every changing requirement of the textile industry. Always—all ways—Hart Products have done their job in rendering an efficient service to the textile industry.

If you have a processing problem—let Hart research give you the benefit of this long mill experience. Write today for full information on Hartex Products or send for a Hartex Specialist to go over processing problems with you.

HART PRODUCTS CORPORATION
1440 Broadway, New York 18, N. Y.

HARTEX PRODUCTS

Rayon Oils & Sizes	Delustrants
Nylon Oils & Sizes	Leveling Agents
Kier Bleaching Oils	Cationic Softeners
Finishing Oils	Cotton Warp Dressings
Synthetic Detergents	Wetting-Out Agents
Conditioning Agents	Weighting Agents
Scrooping Agents	Mercerizing Penetrants
Sanforizing Oils	
Splashproof Compounds	

Send for free booklet, "Mercerizing and ALKAMERCE—The Ideal Dry Mercerizing Penetrant"

Hart Products

based on research

FREE NEEDLES

for better full fashioned production ..

Clogged needles are enemies of smooth continuous knitting for economical top grade production.

Now that silk is being used again, knitters are using Zurn Bleached Glycerine Softener to keep needles free of gum. Used in the cups or in the troughs it is effective for silk alone or in combination with other fibres in achieving trouble-free knitting with no subsequent dye bath difficulties.

Zurnoil, with over 60 years textile chemical experience has a number of specialties to meet the requirements of conventional or new fibres, new methods and new finishes.

We shall gladly submit samples for trial runs if you will state your problems.

Specialties for
SCOURING
STRIPPING
PENETRATING
FINISHING
LUBRICATION

Zurnoil
TEXTILE CHEMICALS

Oils for all textile conditioning requirements

O. F. ZURN COMPANY
Philadelphia 32, Pa.
KNOXVILLE, TENN. HAMILTON, ONT., CANADA

QUALITY RICHMOND PRODUCTS

CUT DOWN DYEHOUSE
Headaches
USE

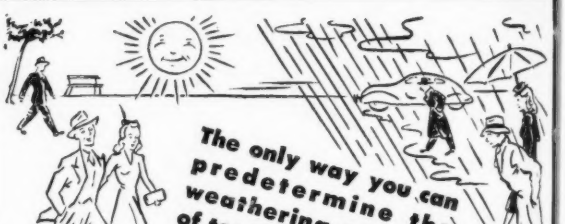
DYETEX

- Disperses Dyestuff
- Scours
- Used in Scrooping

DYETEX

Send for free sample and full information

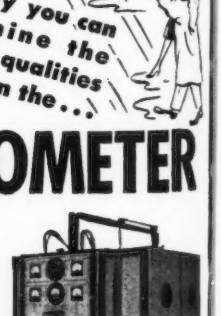
RICHMOND OIL, SOAP & CHEMICAL CO., Inc.
1041-43 FRANKFORD AVE., PHILADELPHIA 25, PA.



WEATHER-OMETER

● The deteriorating effect of exposure to weathering in actual use must be known by textile manufacturers. The Atlas Weather-Ometer brings these weathering conditions right into your laboratory where dyestuffs and fabrics can be tested and reliable results obtained.

A few weeks exposure in the Weather-Ometer with a cycle of controlled light, water spray, and selected temperature and humidity, equals years of outdoor service. Safe to operate 24 hours a day without attention.



Used all over the world — Weather-Ometers, Launder-Ometers, Fade-Ometers

ATLAS ELECTRIC DEVICES CO.
361 West Superior Street, Chicago 10, Illinois

IF YOU'RE DYED PROPERLY

YOU'RE NEVER DEAD!

the secret of fine dyes

SOLVAY SODIUM NITRITE

● FABRICS THAT ARE BEAUTIFULLY DESIGNED and dyed always invite sales. Only quality dyes and dyeing can produce lustrous, colorfast products. In making quality dyes you can confidently rely on SOLVAY Sodium Nitrite. This SOLVAY product stands in a class by itself. . . . Its fine, U.S.P. Grade crystals tend to remain free flowing . . . are of the high quality and purity best suited for the manufacture of azo dyes . . . and for fine textile dyeing.

BE SURE TO specify SOLVAY Sodium Nitrite . . . and you can always be sure of quality.

SOLVAY SALES CORPORATION

Alkalies and Chemical Products Manufactured by The Solvay Process Company

40 RECTOR STREET NEW YORK 6, N. Y.

DYESTUFFS

●

SPECIALTIES

BICK & CO., Inc.

Manufacturing Chemists

Reading, Pa. Charlotte, N. C.

For more efficient wet processing of Cotton, Wool, Rayon, Nylon—

Laurel

Soaps, Oils and Finishes

Laurel Soaps, Oils and Finishes are keyed to the needs of the textile industry by continuous laboratory and mill research. For nearly forty years Laurel technicians have cooperated in the solution of processing problems in individual plants and in the development of special products, among them—

Nylon Hosiery Processing Agents — Save precious processing time, help maintain smooth production flow.

Laurel Coning Oil #443 — Excellent conditioner which makes for better knitting.

Laurel Nynit C — Effective lubricator which prevents sleazy yarn, sticking in pre-boarding operation.

Laurel Supergel — A thorough scour. Quickly removes size, grease, dirt.

Laurezol #6 — Dissolves acetate colors.

Laurel Peramel — A lasting finish.

Laurel Hosiery Finishes — For natural and synthetic fibers and mixtures. Water repellents, spotproofing and waterproofing finishes.

Laurel Emulsions • Soaps • Oils • Finishes • Mildewproofing Compounds

Write today for recommendations.

• SOAPS • OILS • FINISHES •

LAUREL SOAP MANUFACTURING CO., Inc.

Wm. H. Bertolet's Sons • *Established 1909*

WAREHOUSES—PATERSON, N. J. • CHATTANOOGA, TENN. • CHARLOTTE, N. C.

OFFICES—2601 East Tioga St., Philadelphia 34, Pa.

VIRGINIA

SODIUM HYDROSULPHITE AND SO_2

Progressive textile processors are cutting costs with specialized equipment, developed by **VIRGINIA**, for application of these two textile stand-bys. Ask your **VIRGINIA** representative about the "Hydromiser" for regulating the feed of Sodium Hydrosulphite, and **VIRGINIA'S** semi-automatic antichlor method for controlling SO_2 concentrations in the sour box.

Offices and Stocks in:
New York • Boston
Philadelphia
Detroit • Charlotte

VIRGINIA

SMELTING COMPANY

WEST NORFOLK, VIRGINIA

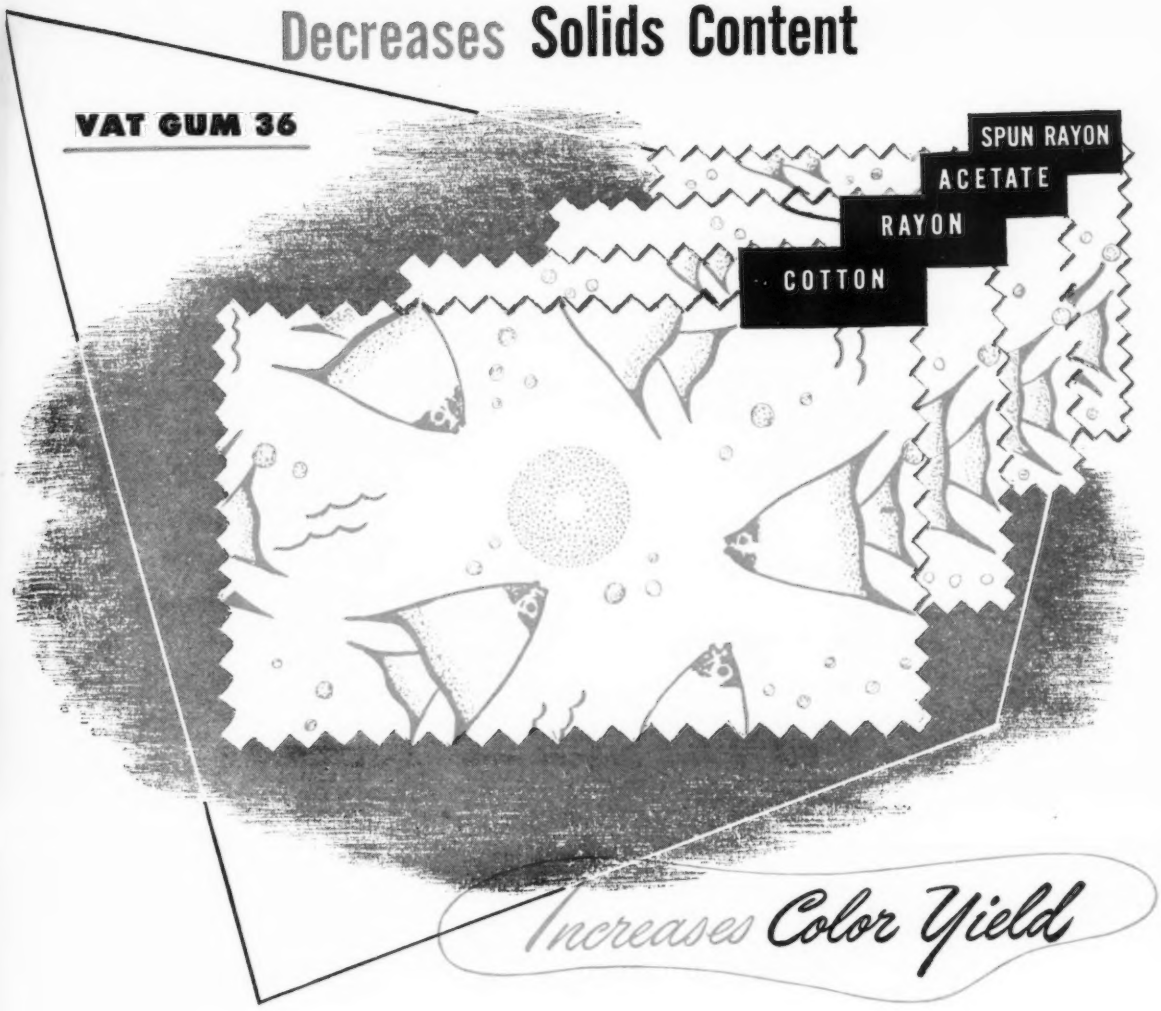
SYNTHETIC DETERGENTS

ANILINE COLORS
NATURAL DYESTUFFS
SIZINGS and FINISHING MATERIALS

UNITED CHEMICAL PRODUCTS CORPORATION

Main Office:
753 MONTGOMERY STREET • JERSEY CITY 6, N. J.
Plant:
YORK AND GOLGATE STREETS • JERSEY CITY 2, N. J.
Branches:
GREENSBORO, N. C. • PAWTUCKET, R. I.
Western Agents: CHEMICAL PRODUCTS CO., AURORA, ILL.

Decreases Solids Content



VAT GUM 36 is a smooth-textured, free flowing vat printing thickener. It reduces solids content requirements by as much as 40% over ordinary cook-up types. It offers excellent rinsibility. It produces prints with sharp detail, unbroken lines and superior color yield.

VAT GUM 36 is highly recommended for printing cotton, rayon, spun rayon, or acetate fabrics. Its cohesive, long-flowing characteristics provide better working properties in the machine and increased printing speeds. Its low solids content leaves the cloth soft and pliable.

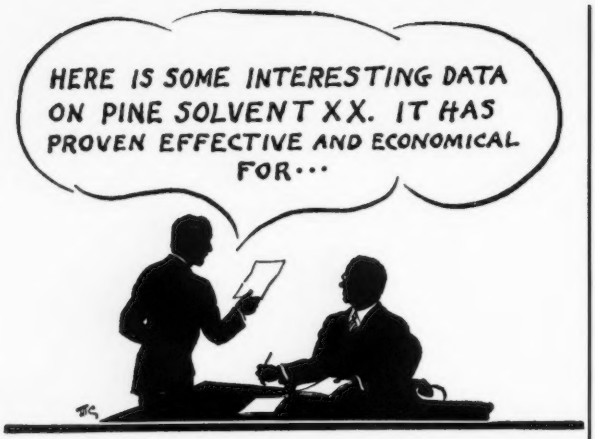
Further, the low solids content of pastes made with VAT GUM 36 allows the residual gum to wash out of printed fabrics completely. It minimizes the danger of 'mark-offs' or bleeding in the ager or soaper. It assures an exceptionally high color yield — with a maximum depth and brightness of shade. Write for full information.

National also produces: AMBERTEX, a heavy-bodied thickener for white discharge, direct and vat color printing; AZO GUM for Rapidogen or Pharmosol, Indigosol or Algosol and Napthol colors; FIBERTEX for finishing sheer cottons and rayons; AMYLON, a cook-up type, to replace natural gums as a printing thickener; FABRIC ADHESIVE 584 to keep patterns in register and speed production.

Offices: 270 Madison Avenue, New York 16; Boston, Philadelphia, Chicago, Indianapolis, New Orleans, San Francisco and other principal cities. In Canada: Meredith, Simmons & Co., Ltd., Toronto. In Holland: Nationale Zetmeelindustrie, N.V., Veendam.

National
STARCH PRODUCTS

STARCHES — *AND SPECIALTIES WITH EASILY DEMONSTRATED SUPERIORITY*



COTTON: In the kier, Pine Solvent XX brings the liquor in contact with every fiber, leaves uniform bottoms that dye and finish more evenly. Boiling time is cut. Fibers are softer, fuller, more resistant to age-discoloration.

WOOL: Pine Solvent XX is valuable in raw-wool scouring . . . irreplaceable in fulling. From the raw stock it produces clean, soft, really white wool in prime condition for storage or further processing. In the fulling mill, it cuts time as much as 30% . . . costs no more . . . helps you meet contract delivery dates on time.

RAYON: In boiling off, Pine Solvent XX rapidly emulsifies gelatinous materials . . . is safe for the most delicate fabrics. Used in dyeing, it makes the fabrics wet out and sink quickly.

DYEING: Pine Solvent XX makes dye liquor penetrate the hardest fibers and heaviest seams. It gives an even, level deposit of dyestuff of uniform depth throughout every fiber. Loose dyestuff and impurities are suspended for washing out completely.

PRINTING: In printing paste, Pine Solvent XX wets pigments thoroughly, disperses them evenly, and holds them in suspension without agglomeration until the design is on the fabric. Designs are sharp, colors bright and clear, no specks are formed.

CUT TIME AND COST– IMPROVE RESULTS IN ALL WET PROCESSING WITH BURK-SCHIER PINE SOLVENT XX

Burk-Schier Pine Solvent XX Reduces Surface and Interfacial Tensions . . . Wets, Penetrates, Suspends, Disperses . . . Aids Detergents and Dyes. A Little Does a Lot and Does It Well.

SCOURING WETTING PINE-SOLVENT BLEACHING DYEING

BURKART-SCHIER CHEMICAL CO.

BURK-SCHIER CHATTANOOGA, TENNESSEE BURK-SCHIER

PENETRANTS • SOFTENERS • SOLUBLE OILS FINISHES

INDEX TO ADVERTISERS

Alrose Chemical Co.
Althouse Chemical Co. ..... Second Cover
Amalgamated Chemical Corp.
American Aniline Products, Inc. III
American Cyanamid Co. (Industrial Chem. Div.) ..... Back Cover
American Cyanamid Co. (Textile Resin Dept.)
American Dyewood Company
American Viscose Corp.
Analyte Instruments, Inc.
Aridye Corp.
Arkansas Company, Inc. VI
Arnold-Hoffman & Co., Inc. XXI
Atlantic Chemical Co.
Atlas Electric Devices Co. XXX

Becco Sales Corp. XIII
Bernard Color & Chemical Co.
Bick & Co., Inc. XXXI
Blickman Co., Inc., S.
Borne Scrymser Co.
Burkart-Schier Chemical Co. XXXIV
Butterworth Sons Co., H. W. XXXVI

Calco Chemical Division, American Cyanamid Co.
Calgon, Inc.
Campbell & Co., Inc., John XII
Carbic Color & Chemical Co., Inc. XXII
Carbide & Carbon Chemicals Corp.
Ciba Company, Inc. IX
Colgate-Palmolive-Peet Co.
Commonwealth Color & Chemical Co. XXVI

DePaul Chemical Co., Inc.
Dexter Chemical Corp.
Drew & Co., Inc., E. F. XXIV
Du Pont de Nemours & Co., E. I.
Dyestuffs Division ..... Front Cover

Electro Metallurgical Co.
Emery Industries, Inc.

Fancourt & Co., W. F.

Geigy Company, Inc.
General Dyestuff Corp.
Girdler Corporation, The XXV
Givaudan-Delawanna, Inc. XXVIII

Hart Products Corp. XXIX
Hardesty Co., W. C. XX
Hooker Electrochemical Co. XIV

International Salt Co., Inc.

Johnson & Son, Inc., S. C. XXVI

Kali Manufacturing Co.
Kearny Mfg. Co., Inc.
Kelco Co.

Laurel Soap Mfg. Co., Inc. XXXII
Lea ex Chemical Co. XXVIII
Leeds & Northrup Co.

Mathieson Alkali Works, Inc.
Maywood Chemical Works
Monsanto Chemical Co.
Myles Salt Co., Ltd.

National Aniline Division, Allied Chemical & Dye Corp. XV
National Carbon Co.
National Oil Products Co. XVIII
National Starch Products Inc. XXXIII
Nova Chemical Corp. XXVIII
Nuodex Products Co., Inc.
Nyanza Color & Chemical Co. IV
Onyx Oil & Chemical Co. X

Pabst Sales Company
Perkins & Sons, Inc., B. F. XIX
Philadelphia Quartz Co.
Procter & Gamble VIII

Refined Products Co. VII
Pichmond Oil Soap & Chemical Co., Inc. ..... XXVI, XXX
Rohm & Haas Co. XXXV
Royce Chemical Co.
Rumford Chemical Co.

Sandoz Chemical Works
Scholler Bros., Inc. ..... Third Cover
Sneny-Vacuum Oil Co., Inc.
Solvay Sales Corp. XXXI
Sonneborn Sons, L., Inc.
Standard Brands Inc.
Standard Chemical Products, Inc.
Standard Fabricaters Inc.
Standard Oil Co. of N. J. XVII
Stein, Hall & Co., Inc.

Tennessee Eastman Corp.
Titan Chemical Products, Inc.

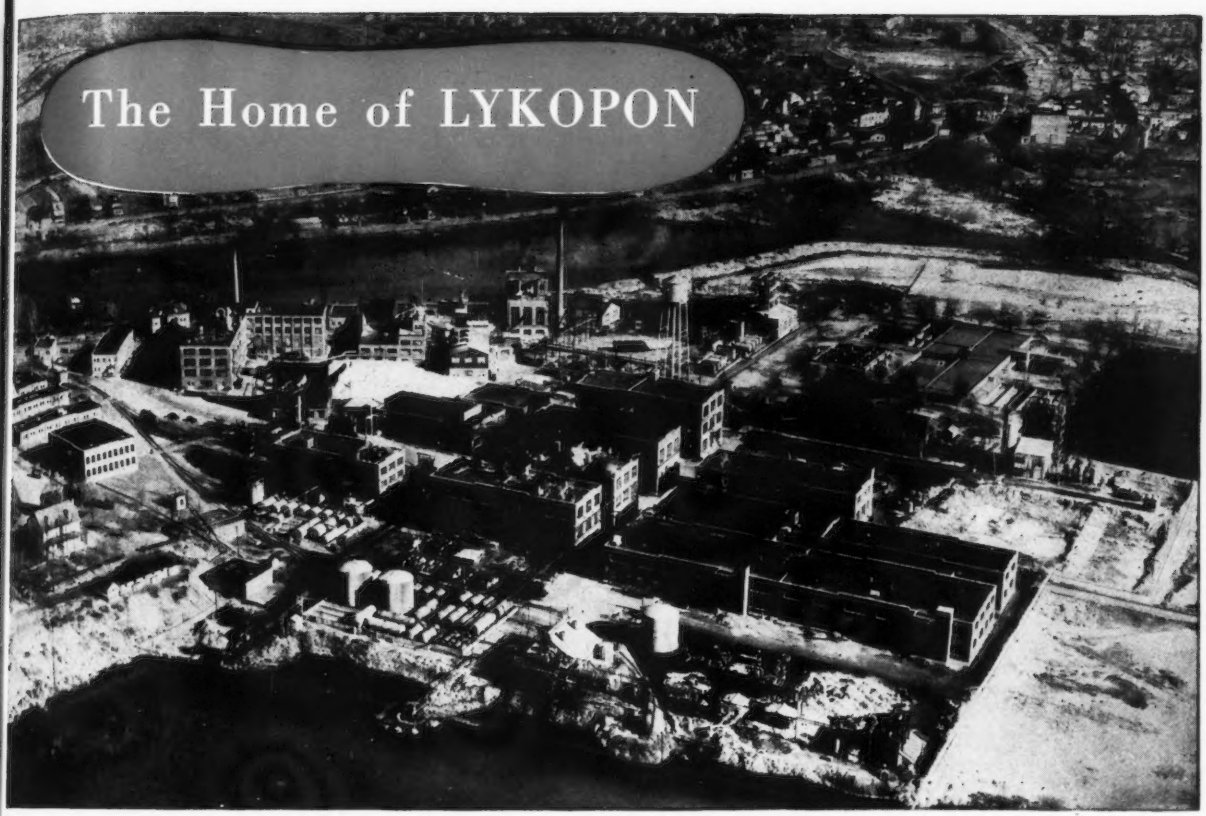
Ultra Chemical Works
Union Carbide & Carbon Corp.
United Chemical Products Corp. XXXII

Van Vlaanderen Machine Co. V
Virginia Smelting Co. XXXII

Wallerstein Co., Inc. XI
War Assets Admin. XXVII
Warwick Chemical Co.
Watson Park Co.
Wolf & Co., Jacques

Young Aniline Works
Young Co., J. S.

Zinsser & Co., Inc.
Zurn Co., O. F. XXX



. . . and other reliable textile chemicals

THE SERVICE THAT BUILT OUR BUSINESS CAN HELP YOURS

Our business has been built largely on the practical help we have been able to give our customers, right in their own plants, in adapting Rohm & Haas products to their needs.

Our representatives are men with technical training and practical experience in the use of industrial chemicals. Call in a member of our textile chemicals department when you need assistance in choosing or using . . .

Chemicals For Fine Textiles

This is the Bristol, Pa. plant of the Rohm & Haas Company, where many of the long line of dependable textile chemicals are produced.

LYKOPON . . .	The first Sodium Hydrosulfite—and still the foremost.
FORMOPON . . .	Sodium Sulfoxylate Formaldehyde — the industry's standard for purity and performance.
PROTOLIN . . . PROTOLIN W . . . FORMOPON EXTRA . . .	Zinc Hydrosulfite and Zinc Sulfoxylates — dependable reducing agents for stripping every fiber.
RHOZYME DX . . . RHOZYME PF . . .	Textile enzymes — stable powders for the uniform desizing of all fabrics.
RHOPLEXES . . .	Acrylic Resins in a complete range of modern finishes for quality textiles.

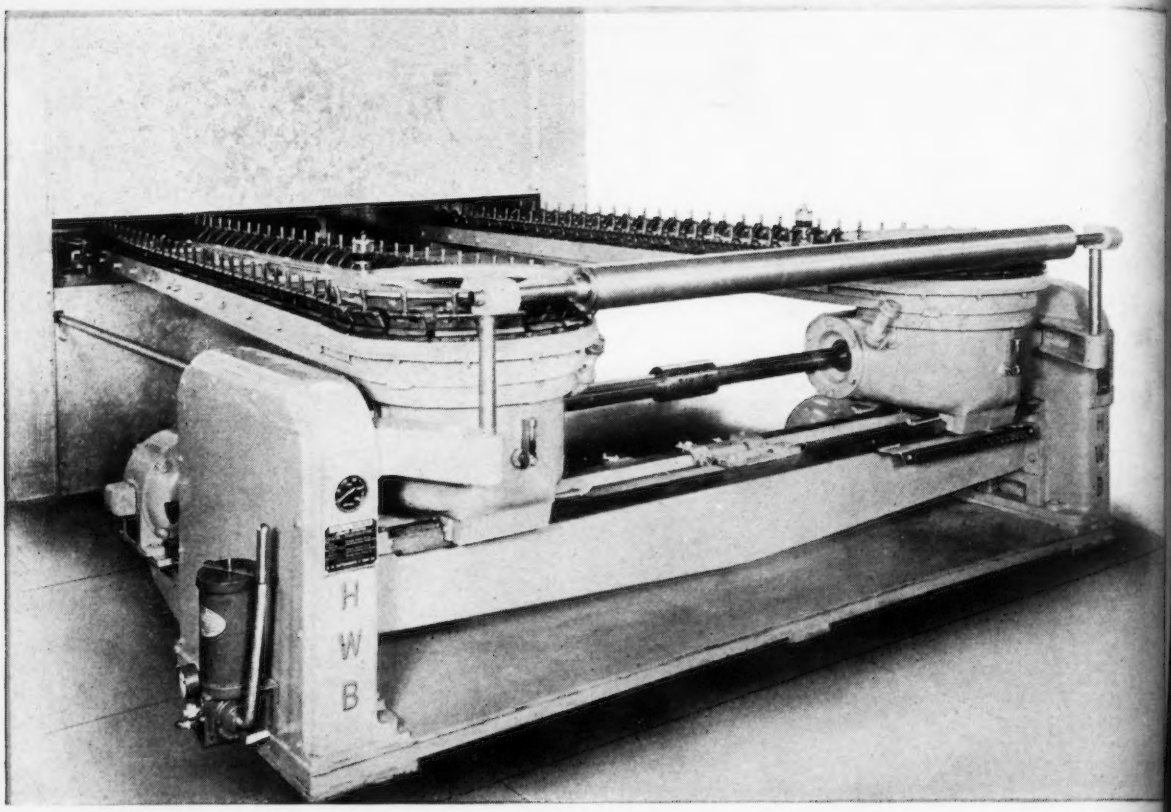
LYKOPON, FORMOPON, PROTOLIN, RHOZYME & RHOPLEX *are trade-marks, Reg. U. S. Pat. Off.*

Represented in Canada by Rohm & Haas Company of Canada, Ltd., Toronto; and in South America by Cia. Rohm y Haas, S. R. L., Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities.

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

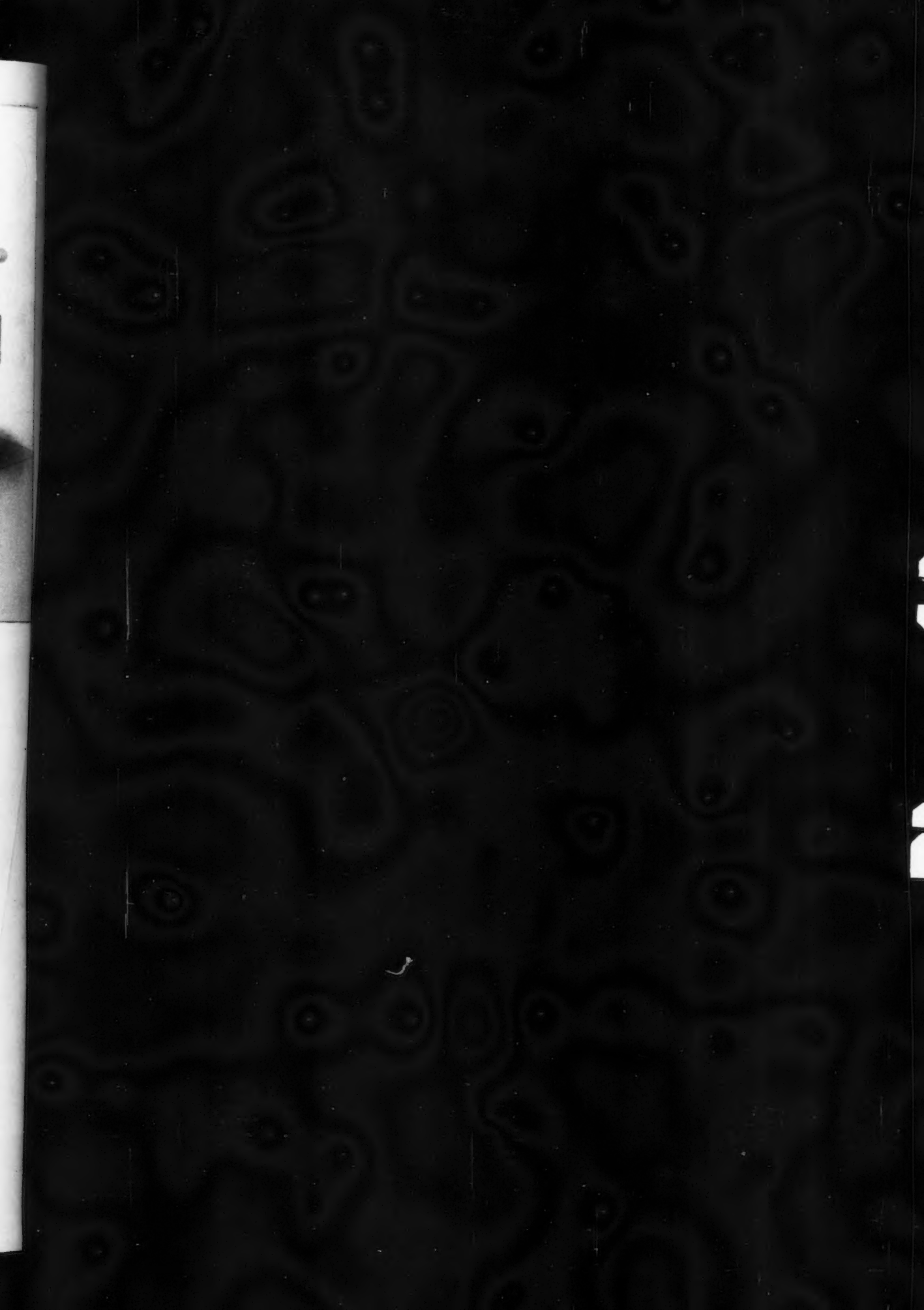
Manufacturers of Chemicals for the Textile, Leather and other Industries . . . Plastics . . . Synthetic Insecticides . . . Fungicides . . . Enzymes



Prevent Costly Seconds Where It Really Counts

It's the most talked about Tenter ever built by Butterworth and here's why. Production records show that the Butterworth Straight Automatic Tenter increases speeds in the finishing operation, reduces seconds, and cuts costs. You will be amazed at the performance of the new heavy duty drive, the strong, steady speeds, the lower horsepower requirements. Speeds range as high as 225 yards per minute. Width and speed indicators are located within easy reach of the operator, helping to reduce seconds where they are most costly—in the finishing operation. Oversize sprockets and chain openers reduce wear on chain and nippers. Prevent costly shutdowns. Cut maintenance costs. For more detailed information, write us today.

BUTTERWORTH

H. W. BUTTERWORTH & SONS COMPANY, Philadelphia 25, Pa.

TEXTILE FINISHING MACHINERY COMPANY DIVISION, Providence, R. I. • 1211 Johnston Bldg., Charlotte, N. C. • W. J. Westaway Co., Hamilton, Ont. • ARGENTINA: Storer & Cia., Chacabuco 443-49, Buenos Aires • BOLIVIA: Schneiter & Cia., Ltda., La Paz • CHILE: Schneiter & Cia., Ltda., Casilla 2864, Santiago • COLOMBIA: C. E. Halaby & Co., Apartado 139, Medellin • ECUADOR: Richard O. Custer, S. A., Quito • MEXICO: I. Slobotzky, Avenida Uruguay 55, Mexico, D. F. • PERU: Custer & Thommen, Casilla 733, Lima • URUGUAY: Storer & Cia., Ltda., Calle Paysandu 1022, Montevideo. VENEZUELA: Herbert Zander & Co., Apartado Postal 1291, Caracas.